HOBART®
WELDING PRODUCTS

OM-945 194 047
October 1999

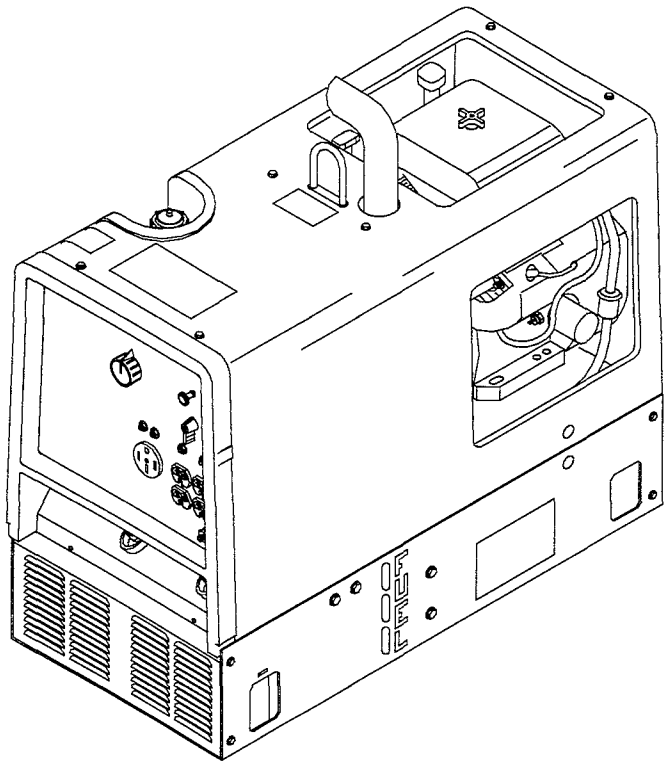
Processes

Stick (SMAW) Welding

Description

Engine Driven Welding Generator

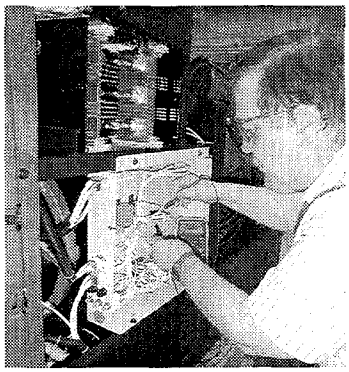
Champion™ 10,000



OWNER'S MANUAL

From Hobart to You

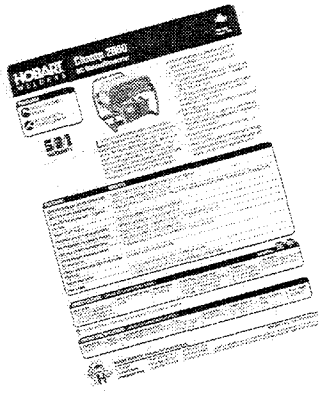
Thank you and *congratulations* on choosing Hobart. Now you can get the job done and get it done right. We know you don't have time to do it any other way.



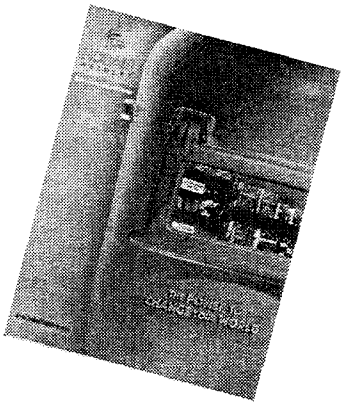
This Owner's Manual is designed to help you get the most out of your Hobart products. Please take time to read the Safety precautions. They will help you protect yourself against potential hazards on the worksite. We've made installation and operation quick and easy. With Hobart you can count on years of reliable service with proper maintenance. And if for some reason the unit needs repair, there's a Troubleshooting section that will help you figure out what the problem is. The parts list will then help you to decide which exact part you may need to fix the problem. Warranty and service information for your particular model are also provided.

ISO 9001 REGISTERED QUALITY SYSTEM

Hobart is registered to the ISO 9001 Quality System Standard.



Hobart Welders manufactures a full line of welders and welding related equipment. For information on other quality Hobart products, contact your local Hobart distributor to receive the latest full line catalog or individual catalog sheets. To locate your nearest distributor call 1-877-Hobart1.



5/3/1 WARRANTY

Working as hard as you do – every power source from Hobart is backed by the best warranty in the business.

Hobart offers a Technical Manual which provides more detailed service and parts information for your unit. To obtain a Technical Manual, contact your local distributor. Your distributor can also supply you with Welding Process Manuals such as SMAW, GTAW, GMAW, and GMAW-P.

HOBART®
WELDING PRODUCTS

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⚠ WARNING

This product, when used for welding or cutting, produces fumes or gases which contain chemicals known to the State of California to cause birth defects and, in some cases, cancer. (California Health & Safety Code Section 25249.5 et seq.)

⚠ WARNING

The engine exhaust from this product contains chemicals known to the State of California to cause cancer, birth defects, or other reproductive harm.

The following terms are used interchangeably throughout this manual:

Stick = SMAW

SECTION 1 - SAFETY PRECAUTIONS - READ BEFORE USING

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1-1. Symbol Usage

Means Warning! Watch Out! There are possible hazards with this procedure! The possible hazards are shown in the adjoining symbols.

▲ **Marks a special safety message.**

☞ *Means "Note"; not safety related.*

This group of symbols means Warning! Watch Out! possible ELECTRIC SHOCK, MOVING PARTS, and HOT PARTS hazards. Consult symbols and related instructions below for necessary actions to avoid the hazards.

1-2. Arc Welding Hazards

▲ **The symbols shown below are used throughout this manual to call attention to and identify possible hazards. When you see the symbol, watch out, and follow the related instructions to avoid the hazard. The safety information given below is only a summary of the more complete safety information found in the Safety Standards listed in Section 1-5. Read and follow all Safety Standards.**

▲ **Only qualified persons should install, operate, maintain, and repair this unit.**

▲ **During operation, keep everybody, especially children, away.**

ELECTRIC SHOCK can kill.

Touching live electrical parts can cause fatal shocks or severe burns. The electrode and work circuit is electrically live whenever the output is on. The input power circuit and machine internal circuits are also live when power is on. In semiautomatic or automatic wire welding, the wire, wire reel, drive roll housing, and all metal parts touching the welding wire are electrically live. Incorrectly installed or improperly grounded equipment is a hazard.

- Do not touch live electrical parts.
- Wear dry, hole-free insulating gloves and body protection.
- Insulate yourself from work and ground using dry insulating mats or covers big enough to prevent any physical contact with the work or ground.
- Do not use AC output in damp areas, if movement is confined, or if there is a danger of falling.
- Use AC output ONLY if required for the welding process.
- If AC output is required, use remote output control if present on unit.
- Disconnect input power or stop engine before installing or servicing this equipment. Lockout/tagout input power according to OSHA 29 CFR 1910.147 (see Safety Standards).
- Properly install and ground this equipment according to its Owner's Manual and national, state, and local codes.
- Always verify the supply ground - check and be sure that input power cord ground wire is properly connected to ground terminal in disconnect box or that cord plug is connected to a properly grounded receptacle outlet.
- When making input connections, attach proper grounding conductor first - double-check connections.
- Frequently inspect input power cord for damage or bare wiring - replace cord immediately if damaged - bare wiring can kill.
- Turn off all equipment when not in use.
- Do not use worn, damaged, undersized, or poorly spliced cables.
- Do not drape cables over your body.
- If earth grounding of the workpiece is required, ground it directly with a separate cable.
- Do not touch electrode if you are in contact with the work, ground, or another electrode from a different machine.
- Use only well-maintained equipment. Repair or replace damaged parts at once. Maintain unit according to manual.
- Wear a safety harness if working above floor level.
- Keep all panels and covers securely in place.
- Clamp work cable with good metal-to-metal contact to workpiece or worktable as near the weld as practical.
- Insulate work clamp when not connected to workpiece to prevent contact with any metal object.
- Do not connect more than one electrode or work cable to any single weld output terminal.

SIGNIFICANT DC VOLTAGE exists after stopping engine on inverters.

- Stop engine on inverter and discharge input capacitors according to instructions in Maintenance Section before touching any parts.

ARC RAYS can burn eyes and skin.

Arc rays from the welding process produce intense visible and invisible (ultraviolet and infrared) rays that can burn eyes and skin. Sparks fly off from the weld.

- Wear a welding helmet fitted with a proper shade of filter to protect your face and eyes from arc rays and sparks when welding or watching (see ANSI Z49.1 and Z87.1 listed in Safety Standards).
- Wear approved safety glasses with side shields under your helmet.
- Use protective screens or barriers to protect others from flash and glare; warn others not to watch the arc.
- Wear protective clothing made from durable, flame-resistant material (wool and leather) and foot protection.

FUMES AND GASES can be hazardous.

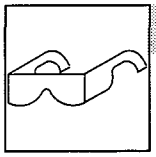
Welding produces fumes and gases. Breathing these fumes and gases can be hazardous to your health.

- Keep your head out of the fumes. Do not breathe the fumes.
- If inside, ventilate the area and/or use exhaust at the arc to remove welding fumes and gases.
- If ventilation is poor, use an approved air-supplied respirator.
- Read the Material Safety Data Sheets (MSDSs) and the manufacturer's instructions for metals, consumables, coatings, cleaners, and degreasers.
- Work in a confined space only if it is well ventilated, or while wearing an air-supplied respirator. Always have a trained watch-person nearby. Welding fumes and gases can displace air and lower the oxygen level causing injury or death. Be sure the breathing air is safe.
- Do not weld in locations near degreasing, cleaning, or spraying operations. The heat and rays of the arc can react with vapors to form highly toxic and irritating gases.
- Do not weld on coated metals, such as galvanized, lead, or cadmium plated steel, unless the coating is removed from the weld area, the area is well ventilated, and if necessary, while wearing an air-supplied respirator. The coatings and any metals containing these elements can give off toxic fumes if welded.

WELDING can cause fire or explosion.

Welding on closed containers, such as tanks, drums, or pipes, can cause them to blow up. Sparks can fly off from the welding arc. The flying sparks, hot workpiece, and hot equipment can cause fires and burns. Accidental contact of electrode to metal objects can cause sparks, explosion, overheating, or fire. Check and be sure the area is safe before doing any welding.

- Protect yourself and others from flying sparks and hot metal.
- Do not weld where flying sparks can strike flammable material.
- Remove all flammables within 35 ft (10.7 m) of the welding arc. If this is not possible, tightly cover them with approved covers.
- Be alert that welding sparks and hot materials from welding can easily go through small cracks and openings to adjacent areas.
- Watch for fire, and keep a fire extinguisher nearby.
- Be aware that welding on a ceiling, floor, bulkhead, or partition can cause fire on the hidden side.
- Do not weld on closed containers such as tanks, drums, or pipes, unless they are properly prepared according to AWS F4.1 (see Safety Standards).
- Connect work cable to the work as close to the welding area as practical to prevent welding current from traveling long, possibly unknown paths and causing electric shock and fire hazards.
- Do not use welder to thaw frozen pipes.
- Remove stick electrode from holder or cut off welding wire at contact tip when not in use.
- Wear oil-free protective garments such as leather gloves, heavy shirt, cuffless trousers, high shoes, and a cap.
- Remove any combustibles, such as a butane lighter or matches, from your person before doing any welding.



FLYING METAL can injure eyes.

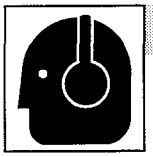
- Welding, chipping, wire brushing, and grinding cause sparks and flying metal. As welds cool, they can throw off slag.
- Wear approved safety glasses with side shields even under your welding helmet.

BUILDUP OF GAS can injure or kill.

- Shut off shielding gas supply when not in use.
- Always ventilate confined spaces or use approved air-supplied respirator.

HOT PARTS can cause severe burns.

- Allow cooling period before maintaining.
- Wear protective gloves and clothing when working on a hot engine.
- Do not touch hot engine parts or just-welded parts bare-handed.



NOISE can damage hearing.

Noise from some processes or equipment can damage hearing.

- Wear approved ear protection if noise level is high.

MAGNETIC FIELDS can affect pacemakers.

- Pacemaker wearers keep away.
- Wearers should consult their doctor before going near arc welding, gouging, or spot welding operations.

CYLINDERS can explode if damaged.

Shielding gas cylinders contain gas under high pressure. If damaged, a cylinder can explode. Since gas cylinders are normally part of the welding process, be sure to treat them carefully.

- Protect compressed gas cylinders from excessive heat, mechanical shocks, slag, open flames, sparks, and arcs.
- Install cylinders in an upright position by securing to a stationary support or cylinder rack to prevent falling or tipping.
- Keep cylinders away from any welding or other electrical circuits.
- Never drape a welding torch over a gas cylinder.
- Never allow a welding electrode to touch any cylinder.
- Never weld on a pressurized cylinder - explosion will result.
- Use only correct shielding gas cylinders, regulators, hoses, and fittings designed for the specific application; maintain them and associated parts in good condition.
- Turn face away from valve outlet when opening cylinder valve.
- Keep protective cap in place over valve except when cylinder is in use or connected for use.
- Read and follow instructions on compressed gas cylinders, associated equipment, and CGA publication P-1 listed in Safety Standards.

1-3. Engine Hazards

FUEL can cause fire or explosion.

- Stop engine and let it cool off before checking or adding fuel.
- Do not add fuel while smoking or if unit is near any sparks or open flames.
- Do not overfill tank - allow room for fuel to expand.
- Do not spill fuel. If fuel is spilled, clean up before starting engine.
- Dispose of rags in a fireproof container.

STEAM AND HOT COOLANT can burn.

- If possible, check coolant level when engine is cold to avoid scalding.
- Always check coolant level at overflow tank, if present on unit, instead of radiator (unless told otherwise in maintenance section or engine manual).
- If the engine is warm, checking is needed, and there is no overflow tank, follow the next two statements.
- Wear safety glasses and gloves and put a rag over radiator cap.
- Turn cap slightly and let pressure escape slowly before completely removing cap.

MOVING PARTS can cause injury.

- Keep away from fans, belts, and rotors.
- Keep all doors, panels, covers, and guards closed and securely in place.

- Stop engine before installing or connecting unit.
- Have only qualified people remove guards or covers for maintenance and troubleshooting as necessary.
- To prevent accidental starting during servicing, disconnect negative (-) battery cable from battery.
- Keep hands, hair, loose clothing, and tools away from moving parts.
- Reinstall panels or guards and close doors when servicing is finished and before starting engine.
- Before working on generator, remove spark plugs or injectors to keep engine from kicking back or starting.
- Block flywheel so that it will not turn while working on generator components.

BATTERY EXPLOSION can BLIND.

- Always wear a face shield, rubber gloves, and protective clothing when working on a battery.
- Stop engine before disconnecting or connecting battery cables or servicing battery.

- Do not allow tools to cause sparks when working on a battery.
- Do not use welder to charge batteries or jump start vehicles.
- Observe correct polarity (+ and -) on batteries.
- Disconnect negative (-) cable first and connect it last.

BATTERY ACID can BURN SKIN and EYES.

- Do not tip battery.
- Replace damaged battery.
- Flush eyes and skin immediately with water.

ENGINE EXHAUST GASES can kill.

- Use equipment outside in open, well-ventilated areas.
- If used in a closed area, vent engine exhaust outside and away from any building air intakes.

ENGINE HEAT can cause fire.

- Do not locate unit on, over, or near combustible surfaces or flammables.
- Keep exhaust and exhaust pipes way from flammables.

EXHAUST SPARKS can cause fire.

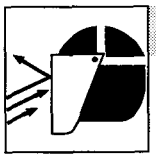
- Do not let engine exhaust sparks cause fire.
- Use approved engine exhaust spark arrestor in required areas - see applicable codes.

1-4. Additional Symbols For Installation, Operation, And Maintenance

FALLING UNIT can cause injury.

- Use lifting eye to lift unit only, NOT running gear, gas cylinders, trailer, or any other accessories.
- Use equipment of adequate capacity to lift and support unit.

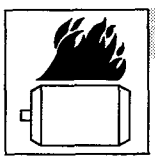
- If using lift forks to move unit, be sure forks are long enough to extend beyond opposite side of unit.



FLYING SPARKS can cause injury.

- Wear a face shield to protect eyes and face.
- Shape tungsten electrode only on grinder with proper guards in a safe location wearing proper face, hand, and body protection.

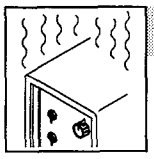
- Sparks can cause fires — keep flammables away.



OVERHEATING can damage motors.

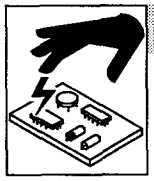
- Turn off or unplug equipment before starting or stopping engine.
- Do not let low voltage and frequency caused by low engine speed damage electric motors.

- Do not connect 50 or 60 Hertz motors to the 100 Hertz receptacle where applicable.



OVERUSE can cause OVERHEATING.

- Allow cooling period; follow rated duty cycle.
- Reduce current or reduce duty cycle before starting to weld again.
- Do not block or filter airflow to unit.

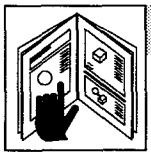


STATIC (ESD) can damage PC boards.

- Put on grounded wrist strap BEFORE handling boards or parts.
- Use proper static-proof bags and boxes to store, move, or ship PC boards.

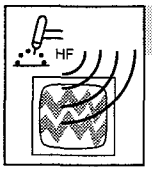
TILTING OF TRAILER can cause injury.

- Use tongue jack or blocks to support weight.
- Properly install welding generator onto trailer according to instructions supplied with trailer.



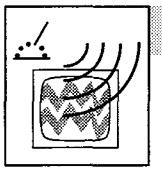
READ INSTRUCTIONS.

- Use only genuine MILLER replacement parts.
- Perform engine maintenance and service according to this manual and the engine manual.



H.F. RADIATION can cause interference.

- High-frequency (H.F.) can interfere with radio navigation, safety services, computers, and communications equipment.
- Have only qualified persons familiar with electronic equipment perform this installation.
- The user is responsible for having a qualified electrician promptly correct any interference problem resulting from the installation.
- If notified by the FCC about interference, stop using the equipment at once.
- Have the installation regularly checked and maintained.
- Keep high-frequency source doors and panels tightly shut, keep spark gaps at correct setting, and use grounding and shielding to minimize the possibility of interference.



ARC WELDING can cause interference.

- Electromagnetic energy can interfere with sensitive electronic equipment such as computers and computer-driven equipment such as robots.
- Be sure all equipment in the welding area is electromagnetically compatible.
- To reduce possible interference, keep weld cables as short as possible, close together, and down low, such as on the floor.
- Locate welding operation 100 meters from any sensitive electronic equipment.
- Be sure this welding machine is installed and grounded according to this manual.
- If interference still occurs, the user must take extra measures such as moving the welding machine, using shielded cables, using line filters, or shielding the work area.

1-5. Principal Safety Standards

Safety in Welding and Cutting, ANSI Standard Z49.1, from American Welding Society, 550 N.W. LeJeune Rd, Miami FL 33126

Safety and Health Standards, OSHA 29 CFR 1910, from Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

Recommended Safe Practices for the Preparation for Welding and Cutting of Containers That Have Held Hazardous Substances, American Welding Society Standard AWS F4.1, from American Welding Society, 550 N.W. LeJeune Rd, Miami, FL 33126

National Electrical Code, NFPA Standard 70, from National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.

Safe Handling of Compressed Gases in Cylinders, CGA Pamphlet P-1, from Compressed Gas Association, 1235 Jefferson Davis Highway, Suite 501, Arlington, VA 22202.

Code for Safety in Welding and Cutting, CSA Standard W117.2, from Canadian Standards Association, Standards Sales, 178 Rexdale Boulevard, Rexdale, Ontario, Canada M9W 1R3.

Safe Practices For Occupation And Educational Eye And Face Protection, ANSI Standard Z87.1, from American National Standards Institute, 1430 Broadway, New York, NY 10018.

Cutting And Welding Processes, NFPA Standard 51B, from National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.

1-6. EMF Information

Considerations About Welding And The Effects Of Low Frequency Electric And Magnetic Fields

Welding current, as it flows through welding cables, will cause electromagnetic fields. There has been and still is some concern about such fields. However, after examining more than 500 studies spanning 17 years of research, a special blue ribbon committee of the National Research Council concluded that: "The body of evidence, in the committee's judgment, has not demonstrated that exposure to power-frequency electric and magnetic fields is a human-health hazard." However, studies are still going forth and evidence continues to be examined. Until the final conclusions of the research are reached, you may wish to minimize your exposure to electromagnetic fields when welding or cutting.

To reduce magnetic fields in the workplace, use the following procedures:

1. Keep cables close together by twisting or taping them.
2. Arrange cables to one side and away from the operator.
3. Do not coil or drape cables around your body.
4. Keep welding power source and cables as far away from operator as practical.
5. Connect work clamp to workpiece as close to the weld as possible.

About Pacemakers:

Pacemaker wearers consult your doctor first. If cleared by your doctor, then following the above procedures is recommended.

SECTION 1 - CONSIGNES DE SÉCURITÉ - LIRE AVANT UTILISATION

1-1. Signification des symboles

Signifie Mise en garde ! Soyez vigilant ! Cette procédure présente des risques de danger ! Ceux-ci sont identifiés par des symboles adjacents aux directives.

▲ **Identifie un message de sécurité particulier.**

☞ *Signifie NOTA ; n'est pas relatif à la sécurité.*

Ce groupe de symboles signifie Mise en garde ! Soyez vigilant ! Il y a des risques de danger reliés aux CHOCS ÉLECTRIQUES, aux PIÈCES EN MOUVEMENT et aux PIÈCES CHAUDES. Reportez-vous aux symboles et aux directives ci-dessous afin de connaître les mesures à prendre pour éviter tout danger.

1-2. Dangers relatifs au soudage à l'arc

▲ **Les symboles présentés ci-après sont utilisés tout au long du présent manuel pour attirer votre attention et identifier les risques de danger. Lorsque vous voyez un symbole, soyez vigilant et suivez les directives mentionnées afin d'éviter tout danger. Les consignes de sécurité présentées ci-après ne font que résumer l'information contenue dans les normes de sécurité énumérées à la section 1-5. Veuillez lire et respecter toutes ces normes de sécurité.**

▲ **L'installation, l'utilisation, l'entretien et les réparations ne doivent être confiés qu'à des personnes qualifiées.**

▲ **Au cours de l'utilisation, tenir toute personne à l'écart et plus particulièrement les enfants.**

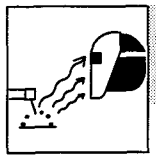
UN CHOC ÉLECTRIQUE peut tuer.

Un simple contact avec des pièces électriques peut provoquer une électrocution ou des blessures graves. L'électrode et le circuit de soudage sont sous tension dès que l'appareil est sur ON. Le circuit d'entrée et les circuits internes de l'appareil sont également sous tension à ce moment-là. En soudage semi-automatique ou automatique, le fil, le dévidoir, le logement des galets d'entraînement et les pièces métalliques en contact avec le fil de soudage sont sous tension. Des matériels mal installés ou mal mis à la terre présentent un danger.

- Ne jamais toucher les pièces électriques sous tension.
- Porter des gants et des vêtements de protection secs ne comportant pas de trous.
- S'isoler de la pièce et de la terre au moyen de tapis ou d'autres moyens isolants suffisamment grands pour empêcher le contact physique éventuel avec la pièce ou la terre.
- Ne pas se servir de source électrique àcourant électrique dans les zones humides, dans les endroits confinés ou là où on risque de tomber.
- Se servir d'une source électrique àcourant électrique UNIQUEMENT si le procédé de soudage le demande.
- Si l'utilisation d'une source électrique àcourant électrique s'avère nécessaire, se servir de la fonction de télécommande si l'appareil en est équipé.
- Couper l'alimentation ou arrêter le moteur avant de procéder à l'installation, à la réparation ou à l'entretien de l'appareil. Déverrouiller l'alimentation selon la norme OSHA 29 CFR 1910.147 (voir normes de sécurité).
- Installer et mettre à la terre correctement cet appareil conformément à son manuel d'utilisation et aux codes nationaux, provinciaux et municipaux.
- Toujours vérifier la terre du cordon d'alimentation - Vérifier et s'assurer que le fil de terre du cordon d'alimentation est bien raccordé à la borne de terre du sectionneur ou que la fiche du cordon est raccordée à une prise correctement mise à la terre.
- En effectuant les raccordements d'entrée fixer d'abord le conducteur de mise à la terre approprié et contre-vérifier les connexions.
- Vérifier fréquemment le cordon d'alimentation pour voir s'il n'est pas endommagé ou dénudé - remplacer le cordon immédiatement s'il est endommagé - un câble dénudé peut provoquer une électrocution.
- Mettre l'appareil hors tension quand on ne l'utilise pas.
- Ne pas utiliser des câbles usés, endommagés, de grosseur insuffisante ou mal épissés.
- Ne pas enrouler les câbles autour du corps.
- Si la pièce soudée doit être mise à la terre, le faire directement avec un câble distinct - ne pas utiliser le connecteur de pièce ou le câble de retour.
- Ne pas toucher l'électrode quand on est en contact avec la pièce, la terre ou une électrode provenant d'une autre machine.
- N'utiliser qu'un matériel en bon état. Réparer ou remplacer sur-le-champ les pièces endommagées. Entretenir l'appareil conformément à ce manuel.
- Porter un harnais de sécurité quand on travaille en hauteur.
- Maintenir solidement en place tous les panneaux et capots.
- Fixer le câble de retour de façon à obtenir un bon contact métal-métal avec la pièce à souder ou la table de travail, le plus près possible de la soudure.
- Isoler la pince de masse quand pas mis à la pièce pour éviter le contact avec tout objet métallique.

Une tension DC importante subsiste à l'intérieur des onduleurs après avoir coupé l'alimentation.

- Couper l'alimentation du poste et décharger les condensateurs d'entrée comme indiqué dans la Section Maintenance avant de toucher des composants.



LES RAYONS DE L'ARC peuvent provoquer des brûlures dans les yeux et sur la peau.

Le rayonnement de l'arc du procédé de soudage génère des rayons visibles et invisibles intenses (ultraviolets et infrarouges) susceptibles de provoquer des brûlures dans les yeux et sur la peau. Des étincelles sont projetées pendant le soudage.

- Porter un casque de soudage muni d'un écran de filtre approprié pour protéger votre visage et vos yeux pendant le soudage ou pour regarder (voir ANSI Z49.1 et Z87.1 énuméré dans les normes de sécurité).
- Porter des protections approuvés pour les oreilles si le niveau sondre est trop élevé.
- Utiliser des écrans ou des barrières pour protéger des tiers de l'éclair et de l'éblouissement; demander aux autres personnes de ne pas regarder l'arc.
- Porter des vêtements de protection constitué dans une matière durable, résistant au feu (laine ou cuir) et une protection des pieds.

LES FUMÉES ET LES GAZ peuvent être dangereux.

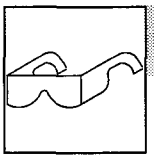
Le soudage génère des fumées et des gaz. Leur inhalation peut être dangereux pour votre santé.

- Eloigner votre tête des fumées. Ne pas respirer les fumées.
- À l'interieur, ventiler la zone et/ou utiliser un échappement au niveau de l'arc pour l'évacuation des fumées et des gaz de soudage.
- Si la ventilation est insuffisante, utiliser un respirateur à alimentation d'air homologué.
- Lire les spécifications de sécurité des matériaux (MSDSs) et les instructions du fabricant concernant les métaux, les consommables, les revêtements, les nettoyants et les dégraisseurs.
- Travailler dans un espace fermé seulement s'il est bien ventilé ou en portant un respirateur à alimentation d'air. Demander toujours à un surveillant dûment formé de se tenir à proximité. Des fumées et des gaz de soudage peuvent déplacer l'air et abaisser le niveau d'oxygène provoquant des blessures ou des accidents mortels. S'assurer que l'air de respiration ne présente aucun danger.
- Ne pas souder dans des endroits situés à proximité d'opérations de dégraissage, de nettoyage ou de pulvérisation. La chaleur et les rayons de l'arc peuvent réagir en présence de vapeurs et former des gaz hautement toxiques et irritants.
- Ne pas souder des métaux munis d'un revêtement, tels que l'acier galvanisé, plaqué en plomb ou au cadmium à moins que le revêtement n'ait été enlevé dans la zone de soudure, que l'endroit soit bien ventilé, et si nécessaire, en portant un respirateur à alimentation d'air. Les revêtements et tous les métaux renfermant ces éléments peuvent dégager des fumées toxiques en cas de soudage.

LE SOUDAGE peut provoquer un incendie ou une explosion.

Le soudage effectué sur des conteneurs fermés tels que des réservoirs, tambours ou des conduites peut provoquer leur éclatement. Des étincelles peuvent être projetées de l'arc de soudure. La projection d'étincelles, des pièces chaudes et des équipements chauds peut provoquer des incendies et des brûlures. Le contact accidentel de l'électrode avec des objets métalliques peut provoquer des étincelles, une explosion, un surchauffement ou un incendie. Avant de commencer le soudage, vérifier et s'assurer que l'endroit ne présente pas de *danger.*

- Se protéger et d'autres personnes de la projection d'étincelles et de métal chaud.
- Ne pas souder dans un endroit là où des étincelles peuvent tomber sur des substances inflammables.
- Déplacer toutes les substances inflammables à une distance de 10,7 m de l'arc de soudage. En cas d'impossibilité les recouvrir soigneusement avec des protections homologués.
- Des étincelles et des matériaux chauds du soudage peuvent facilement passer dans d'autres zones en traversant de petites fissures et des ouvertures.
- Surveiller tout déclenchement d'incendie et tenir un extincteur à proximité.
- Le soudage effectué sur un plafond, plancher, paroi ou séparation peut déclencher un incendie de l'autre côté.
- Ne pas effectuer le soudage sur des conteneurs fermés tels que des réservoirs, tambours, ou conduites, à moins qu'ils n'aient été préparés correctement conformément à AWS F4.1 (voir les normes de sécurité).
- Brancher le câble sur la pièce le plus près possible de la zone de soudage pour éviter le transport du courant sur une longue distance par des chemins inconnus éventuels en provoquant des risques d'électrocution et d'incendie.
- Ne pas utiliser le poste de soudage pour dégeler des conduites gelées.
- En cas de non utilisation, enlever la baguette d'électrode du porte-électrode ou couper le fil à la pointe de contact.
- Porter des vêtements de protection dépourvus d'huile tels que des gants en cuir, une chemise en matériau lourd, des pantalons sans revers, des chaussures hautes et un couvre chef.
- Avant de souder, retirer toute substance combustible de vos poches telles qu'un allumeur au butane ou des allumettes.



DES PARTICULES VOLANTES peuvent blesser les yeux.

- Le soudage, l'écaillement, le passage de la pièce à la brosse en fil de fer, et le meulage génèrent des étincelles et des particules métalliques volantes. Pendant la période de refroidissement des soudures, elles risquent de projeter du laitier.
- Porter des lunettes de sécurité avec écrans latéraux ou un écran facial.

LES ACCUMULATIONS DE GAZ risquent de provoquer des blessures ou même la mort.

- Fermer l'alimentation du gaz protecteur en cas de *non utilisation.*
- Veiller toujours à bien aérer les espaces confinés ou se servir d'un respirateur d'adduction d'air homologué.

DES PIÈCES CHAUDES peuvent provoquer des brûlures graves.

- Prévoir une période de refroidissement avant d'effectuer des travaux d'entretien.
- Porter des gants et des vêtements de protection pour travailler sur un moteur chaud.
- Ne pas toucher à mains nues les parties chaudes du moteur ni les pièces récemment soudées.

LE BRUIT peut affecter l'ouïe.

Le bruit des processus et des équipements peut affecter l'ouïe.

- Porter des protections approuvés pour les oreilles si le niveau sondre est trop élevé.

LES CHAMPS MAGNÉTIQUES peuvent affecter les stimulateurs cardiaques.

- Porteurs de stimulateur cardiaque, restez à distance.
- Les porteurs d'un stimulateur cardiaque doivent *d'abord consulter leur médecin avant de s'approcher* des opérations de soudage à l'arc, de gougeage ou de soudage par points.

Si des BOUTEILLES sont endommagées, elles pourront exploser.

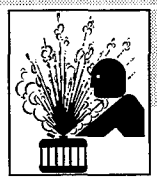
Des bouteilles de gaz protecteur contiennent du gaz sous haute pression. Si une bouteille est endommagée, elle peut exploser. Du fait que les bouteilles de gaz font normalement partie du procédé de soudage, les manipuler avec précaution.

- Protéger les bouteilles de gaz comprimé d'une chaleur excessive, des chocs mécaniques, du laitier, des flammes ouvertes, des étincelles et des arcs.
- Placer les bouteilles debout en les fixant dans un support stationnaire ou dans un porte-bouteilles pour les empêcher de tomber ou de se renverser.
- Tenir les bouteilles éloignées des circuits de soudage ou autres circuits électriques.
- Ne jamais placer une torche de soudage sur une bouteille à gaz.
- Une électrode de soudage ne doit jamais entrer en contact avec une bouteille.
- Ne jamais souder une bouteille pressurisée - risque d'explosion.
- Utiliser seulement des bouteilles de gaz protecteur, régulateurs, tuyaux et raccords convenables pour cette application spécifique; les maintenir ainsi que les éléments associés en bon état.
- Ne pas tenir la tête en face de la sortie en ouvrant la soupape de la bouteille.
- Maintenir le chapeau de protection sur la soupape, sauf en cas d'utilisation ou de branchement de la bouteille.
- Lire et suivre les instructions concernant les bouteilles de gaz comprimé, les équipements associés et les publication P-1 CGA énumérées dans les normes de sécurité.

1-3. Dangers existant en relation avec le moteur

LE CARBURANT MOTEUR peut provoquer un incendie ou une explosion.

- Arrêter le moteur avant de vérifier le niveau de carburant ou de faire le plein.
- Ne pas faire le plein en fumant ou proche d'une source d'étincelles ou d'une flamme nue.
- Ne pas faire le plein de carburant à ras bord; prévoir de l'espace pour son expansion.
- Faire attention de ne pas renverser de carburant. Nettoyer tout carburant renversé avant de faire démarrer le moteur.
- Jeter les chiffons dans un récipient ignifuge.



LA VAPEUR ET LE LIQUIDE DE REFROIDISSEMENT CHAUD peuvent provoquer des brûlures.

- Il est préférable de vérifier le liquide de refroidissement une fois le moteur refroidi pour éviter de se brûler.
- Toujours vérifier le niveau de liquide de refroidissement dans le vase d'expansion (si présent), et non dans le radiateur (sauf si précisé autrement dans la section maintenance du manuel du moteur).
- Si le moteur est chaud et que le liquide doit être vérifié, opérer comme suivant :
- Mettre des lunettes de sécurité et des gants, placer un torchon sur le bouchon du radiateur.
- Dévisser le bouchon légèrement et laisser la vapeur s'échapper avant d'enlever le bouchon.

DES ORGANES MOBILES peuvent provoquer des blessures.

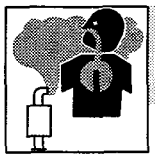
- Ne pas approcher les mains des ventilateurs, courroies et autres pièces en mouvement.
- Maintenir fermés et fixement en place les portes, panneaux, recouvrements et dispositifs de protection.
- Arrêter le moteur avant d'installer ou brancher l'appareil.
- Demander seulement à un personnel qualifié d'enlever les dispositifs de sécurité ou les recouvrements pour effectuer, s'il y a lieu, des travaux d'entretien et de dépannage.
- Pour empêcher tout démarrage accidentel pendant les travaux d'entretien, débrancher le câble négatif (-) de batterie de la borne.
- Ne pas approcher les mains, cheveux, vêtements lâches et outils des organes mobiles.
- Remettre en place les panneaux ou les dipositifs de protection et fermer les portes à la fin des travaux d'entretien et avant de faire démarrer le moteur.
- Avant d'intervenir, déposer les bougies ou injecteurs pour éviter la mise en route accidentelle du moteur.
- Bloquer le volant moteur pour éviter sa rotation lors d'une intervention sur le générateur.

L'EXPLOSION DE LA BATTERIE peut RENDRE AVEUGLE.

- Toujours porter une protection faciale, des gants en caoutchouc et vêtements de protection lors d'une intervention sur la batterie.
- Arrêter le moteur avant de débrancher ou de brancher les câbles de batterie.
- Eviter de provoquer des étincelles avec les outils en travaillant sur la batterie.
- Ne pas utiliser le poste de soudage pour charger les batteries ou des véhicules de démarrage rapide.
- Observer la polarité correcte (+ et -) sur les batteries.
- Débrancher le câble négatif (–) en premier lieu. Le rebrancher en dernier lieu.

L'ACIDE DE LA BATTERIE peut provoquer des brûlures dans les YEUX et sur la PEAU.

- Ne pas renverser la batterie.
- Remplacer une batterie endommagée.
- Rincer immédiatement les yeux et la peau à l'eau.



LES GAZ D'ÈCHAPPEMENT DU MOTEUR peuvent provoquer des accidents mortels.

- Utiliser l'équipement à l'extérieur dans des zones ouvertes et bien ventilées.
- En cas d'utilisation dans un endroit fermé évacuer les gaz d'échappement du moteur vers l'extérieur à distance des entrées d'air dans les bâtiments.

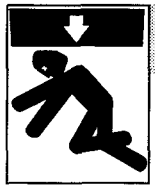
LA CHALEUR DU MOTEUR peut provoquer un incendie.

- Ne pas placer l'appareil sur, au-dessus ou à proximité de surfaces inflammables.
- Tenir à distance les produits inflammables de l'échappement.

LES ÉTINCELLES À L'ÉCHAPPEMENT peuvent provoquer un incendie.

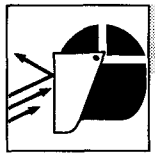
- Empêcher les étincelles d'échappement du moteur de provoquer un incendie.
- Utiliser uniquement un pare-étincelles approuvé - voir codes en vigueur.

1-4. Dangers supplémentaires en relation avec l'installation, le fonctionnement et la maintenance



LA CHUTE DE L'APPAREIL peut blesser.

- Utiliser l'anneau de levage uniquement pour soulever l'appareil lui-même ; sans chariot, de bouteilles de gaz, remorque, ou autres accessoires.
- Utiliser un équipement de levage de capacité suffisante pour lever l'appareil.
- En utilisant des fourches de levage pour déplacer l'unité, s'assurer que les fourches sont suffisamment longues pour dépasser du côté opposé de l'appareil.

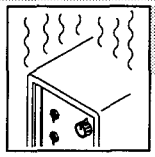


LES ÉTINCELLES VOLANTES risquent de provoquer des blessures.

- Porter un écran facial pour protéger le visage et les yeux.
- Affuterr l'électrode au tungstène uniquement à la meuleuse dotée de protecteurs. Cette manoeuvre est à exécuter dans un endroit sûr lorsque l'on porte l'équipement homologué de protection du visage, des mains et du corps.
- Les étincelles risquent de causer un incendie - éloigner toute substance inflammable.

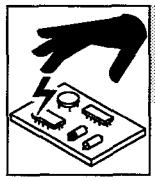
LE SURCHAUFFEMENT peut endommager le moteur électrique.

- Arrêter ou déconnecter l'équipement avant de démarrer ou d'arrêter le moteur.
- Ne pas laisser tourner le moteur trop lentement sous risque d'endommager le moteur électrique à cause d'une tension et d'une fréquence trop faibles.
- Ne pas brancher de moteur de 50 ou de 60 Hz à la prise de 100 Hz, s'il y a lieu.



L'EMPLOI EXCESSIF peut SURCHAUFFER L'ÉQUIPEMENT.

- Laisser l'équipement refroidir ; respecter le facteur de marche nominal.
- Réduire le courant ou le facteur de marche avant de poursuivre le soudage.
- Ne pas obstruer les passages d'air du poste.

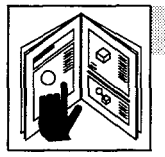


LES CHARGES ÉLECTROSTATIQUES peuvent endommager les circuits imprimés.

- Établir la connexion avec la barrette de terre avant de manipuler des cartes ou des pièces.
- Utiliser des pochettes et des boîtes antistatiques pour stocker, déplacer ou expédier des cartes de circuits imprimes.

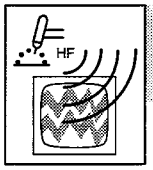
UNE REMORQUE QUI BASCULE peut entraîner des blessures.

- Utiliser les supports de la remorque ou des blocs pour soutenir le poids.
- Installer convenablement le poste sur la remorque comme indiqué dans le manuel s'y rapportant.



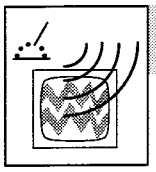
LIRE LES INSTRUCTIONS.

- Utiliser seulement les pièces de rechange d'origine.
- Effecteur la maintenance et la mise en service d'après le manuel et celui du moteur.



LE RAYONNEMENT HAUTE FRÉQUENCE (H.F.) risque de provoquer des interférences.

- Le rayonnement haute fréquence (H.F.) peut provoquer des interférences avec les équipements de radio-navigation et de communication, les services de sécurité et les ordinateurs.
- Demander seulement à des personnes qualifiées familiarisées avec des équipements électroniques de faire fonctionner l'installation.
- L'utilisateur est tenu de faire corriger rapidement par un électricien qualifié les interférences résultant de l'installation.
- Si le FCC signale des interférences, arrêter immédiatement l'appareil.
- Effectuer régulièrement le contrôle et l'entretien de l'installation.
- Maintenir soigneusement fermés les portes et les panneaux des sources de haute fréquence, maintenir les éclateurs à une distance correcte et utiliser une terre et et un blindage pour réduire les interférences éventuelles.



LE SOUDAGE À L'ARC risque de provoquer des interférences.

- L'énergie électromagnétique risque de provoquer des interférences pour l'équipement électronique sensible tel que les ordinateurs et l'équipement commandé par ordinateur tel que les robots.
- Veiller à ce que tout l'équipement de la zone de soudage soit compatible électromagnétiquement.
- Pour réduire la possibilité d'interférence, maintenir les câbles de soudage aussi courts que possible, les grouper, et les poser aussi bas que possible (ex. par terre).
- Veiller à souder à une distance de 100 mètres de tout équipement électronique sensible.
- Veiller à ce que ce poste de soudage soit posé et mis à la terre conformément à ce mode d'emploi.
- En cas d'interférences après avoir pris les mesures précédentes, il incombe à l'utilisateur de prendre des mesures supplémentaires telles que le déplacement du poste, l'utilisation de câbles blindés, l'utilisation de filtres de ligne ou la pose de protecteurs dans la zone de travail.

1-5. Principales normes de sécurité

Safety in Welding and Cutting, norme ANSI Z49.1, de l'American Welding Society, 550 N.W. Lejeune Rd, Miami FL 33126

Safety and Health Sandards, OSHA 29 CFR 1910, du Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

Recommended Safe Practice for the Preparation for Welding and Cutting of Containers That Have Held Hazardous Substances, norme AWS F4.1, de l'American Welding Society, 550 N.W. Lejeune Rd, Miami FL 33126

National Electrical Code, NFPA Standard 70, de la National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.

Safe Handling of Compressed Gases in Cylinders, CGA Pamphlet P-1, de la Compressed Gas Association, 1235 Jefferson Davis Highway, Suite 501, Arlington, VA 22202.

Règles de sécurité en soudage, coupage et procédés connexes, norme CSA W117.2, de l'Association canadienne de normalisation, vente de normes, 178 Rexdale Boulevard, Rexdale (Ontario) Canada M9W 1R3.

Safe Practices For Occupation And Educational Eye And Face Protection, norme ANSI Z87.1, de l'American National Standards Institute, 1430 Broadway, New York, NY 10018.

Cutting and Welding Processes, norme NFPA 51B, de la National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.

1-6. Information sur les champs électromagnétiques

Données sur le soudage électrique et sur les effets, pour l'organisme, des champs magnétiques basse fréquence

Le courant de soudage, pendant son passage dans les câbles de soudage, causera des champs électromagnétiques. Il y a eu et il y a encore un certain souci à propos de tels champs. Cependant, après avoir examiné plus de 500 études qui ont été faites pendant une période de recherche de 17 ans, un comité spécial ruban bleu du National Research Council a conclu: "L'accumulation de preuves, suivant le jugement du comité, n'a pas démontré que l'exposition aux champs magnétiques et champs électriques à haute fréquence représente un risque à la santé humaine". Toutefois, des études sont toujours en cours et les preuves continuent à être examinées. En attendant que les conclusions finales de la recherche soient établies, il vous serait souhaitable de réduire votre exposition aux champs électromagnétiques pendant le soudage ou le coupage.

Afin de réduire les champs électromagnétiques dans l'environnement de travail, respecter les consignes suivantes :

1 Garder les câbles ensembles en les torsadant ou en les attachant avec du ruban adhésif.

2 Mettre tous les câbles du côté opposé de l'opérateur.

3 Ne pas courber pas et ne pas entourer pas les câbles autour de votre corps.

4 Garder le poste de soudage et les câbles le plus loin possible de vous.

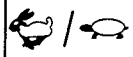
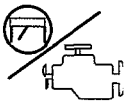
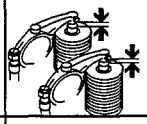
5 Relier la pince de masse le plus près possible de la zone de soudure.

Consignes relatives aux stimulateurs cardiaques :

Les personnes qui portent un stimulateur cardiaque doivent avant tout consulter leur docteur. Si vous êtes déclaré apte par votre docteur, il est alors recommandé de respecter les consignes ci-dessus.

SECTION 2 - DEFINITIONS

2-1. Symbol Definitions

Stop Engine	Fast (Run, Weld/Power)	 Fast/Slow (Run/Idle)	Slow (Idle)
Start Engine	Read Operator's Manual	A Amperes	V Volts
Engine Oil	Fuel	Battery (Engine)	 Engine
Engine Choke	 Check Valve Clearance	Circuit Breaker	Temperature
Positive	Negative	Alternating Current (AC)	Output
h Hours	s Seconds	Time	Protective Earth (Ground)
Welding Arc (Electrode)	Stick (SMAW)		

SECTION 3 - SPECIFICATIONS

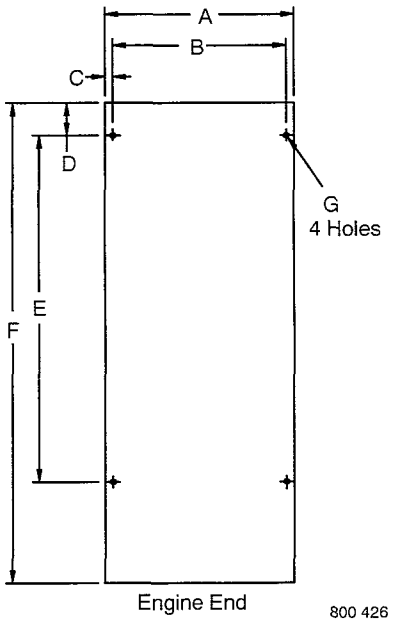
3-1. Weld, Power, and Engine Specifications

Note ☞ *This unit uses either an Onan or a Kohler engine. Differences between models are noted throughout this manual.*

Welding Mode	Weld Output Range	Rated Welding Output	Maximum Open Circuit Voltage	Single-Phase Auxiliary Power Rating	Fuel Capacity	Engine
CC/DC	50 - 230 A	230 A, 25 V, 30% Duty Cycle 210 A, 25 V, 60% Duty Cycle 170 A, 25 V, 100% Duty Cycle	73	10 kVA/kW, 84/42 A, 120/240 V AC, 60 Hz	10 gal (38 L) Tank	Onan Air-Cooled, Two-Cylinder, Four-Cycle, 20.5 HP Gasoline Engine or Kohler CH-20 Air-Cooled, Two-Cylinder, Four-Cycle, 20 HP Gasoline Engine

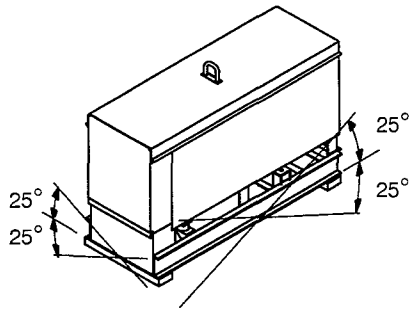
3-2. Dimensions, Weights, and Operating Angles

Dimensions	
Height	33-1/2 in (851 mm)
Width	18-1/2 in (470 mm)
Depth	38 in (965 mm)
A	18 in (457 mm)
B	16-9/16 in (421 mm)
C	3/4 in (19 mm)
D	5-3/4 in (146 mm)
E	31-1/2 in (800 mm)
F	37-1/2 in (953 mm)
G	13/32 in (10 mm) Dia.
Weight	
Onan-Powered Unit: 445 lb (202 kg)	
Kohler-Powered Unit: 444 lb (201 kg)	



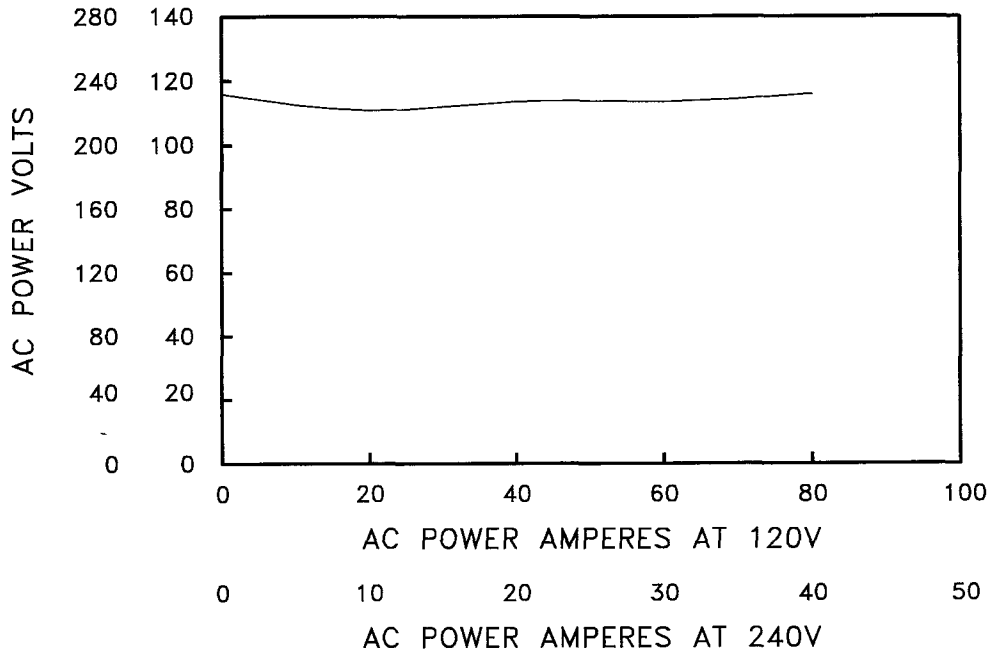
▲ **Do not exceed tilt angles or engine could be damaged or unit could tip.**

▲ **Do not move or operate unit where it could tip.**



3-3. Auxiliary Power Curve

The auxiliary power curve shows the auxiliary power in amperes available at the receptacles.



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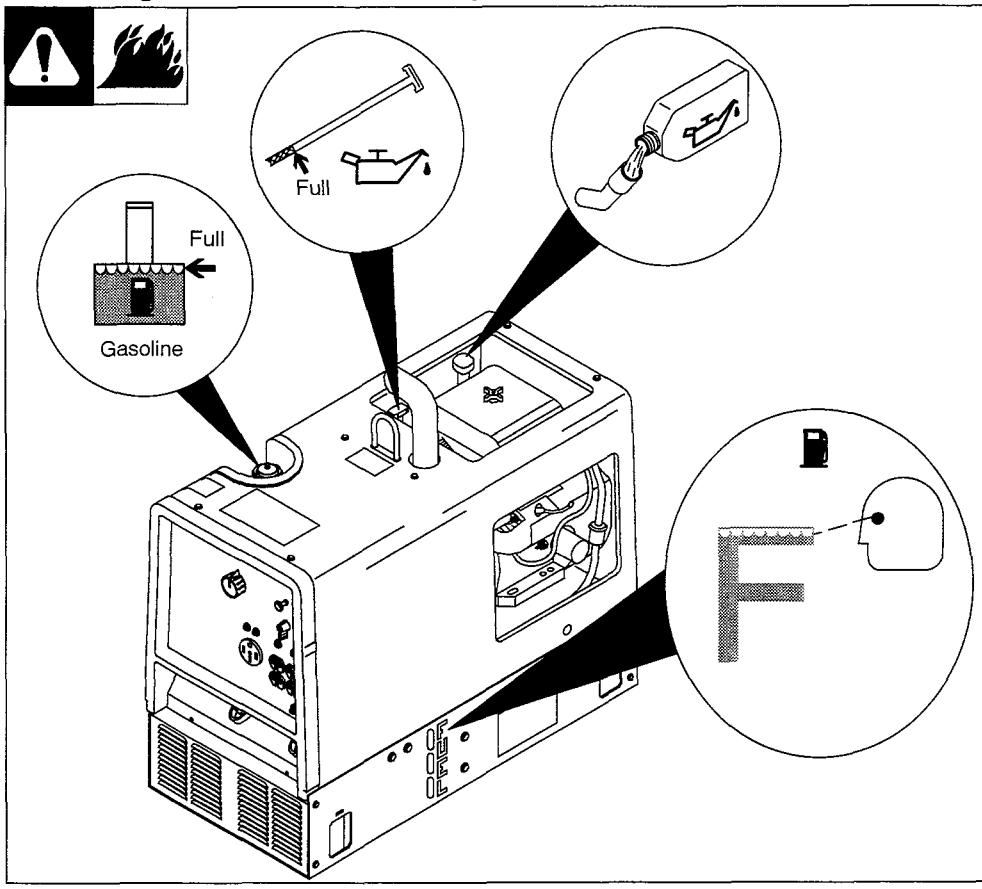
4-2. Engine Prestart Checks (Onan-Powered Units)



Check all fluids daily. Engine must be cold and on a level surface. Unit is shipped with 10W30 engine oil.

Engine stops if oil pressure gets too low.

☞ *Follow run-in procedure in engine manual.*

1 Fuel

Add fresh fuel before starting engine the first time (see maintenance label for specifications). Fill fuel tank up to 1/2 in. (13 mm) from top to allow room for expansion (see fuel tank window on base). Check fuel level on a cold engine before use each day.

2 Oil

After fueling, check oil with unit on level surface. If oil is not up to full mark on dipstick, add oil (see maintenance label).

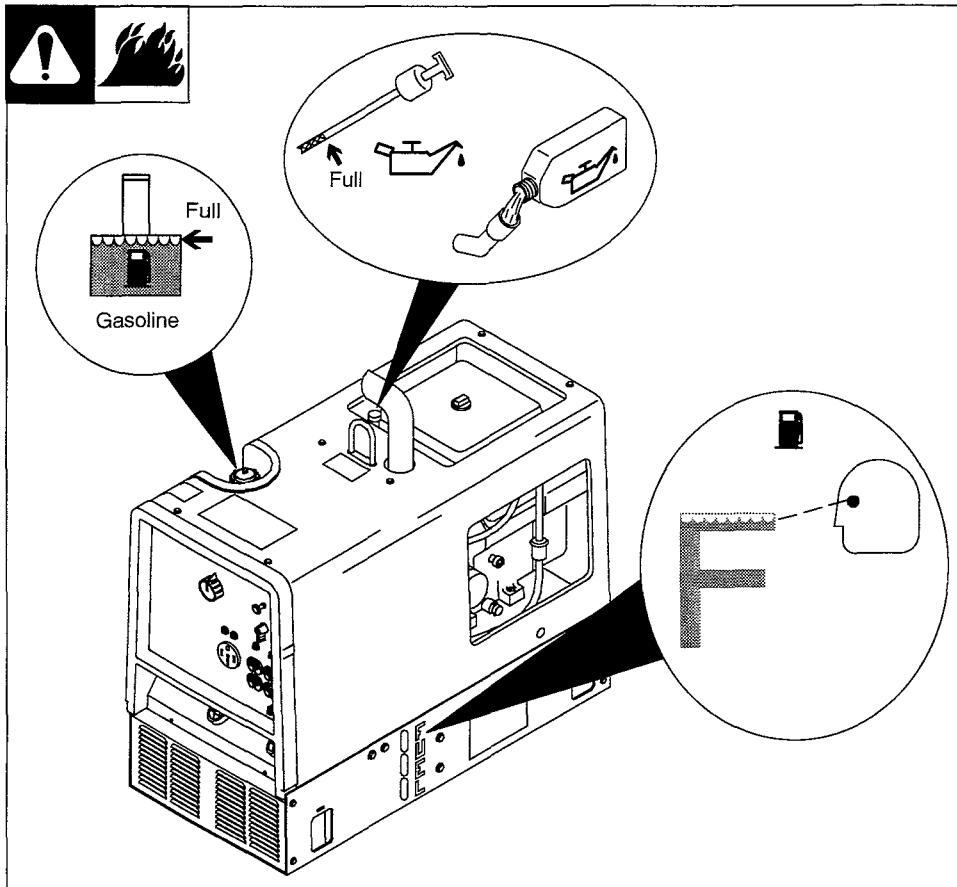
☞ *To improve cold weather starting:*

Keep battery in good condition. Store battery in warm area off concrete surface.

Use correct grade oil for cold weather.

802 353

4-3. Engine Prestart Checks (Kohler-Powered Units)



Check all fluids daily. Engine must be cold and on a level surface. Unit is shipped with 10W30 engine oil.

Engine stops if oil pressure gets too low.

☞ *Follow run-in procedure in engine manual.*

1 Fuel

Add fresh fuel before starting engine the first time (see maintenance label for specifications). Fill fuel tank up to 1/2 in. (13 mm) from top to allow room for expansion (see fuel tank window on base). Check fuel level on a cold engine before use each day.

2 Oil

After fueling, check oil with unit on level surface. If oil is not up to full mark on dipstick, add oil (see maintenance label).

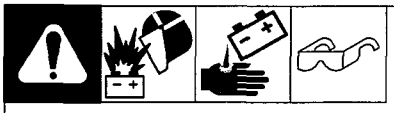
☞ *To improve cold weather starting:*

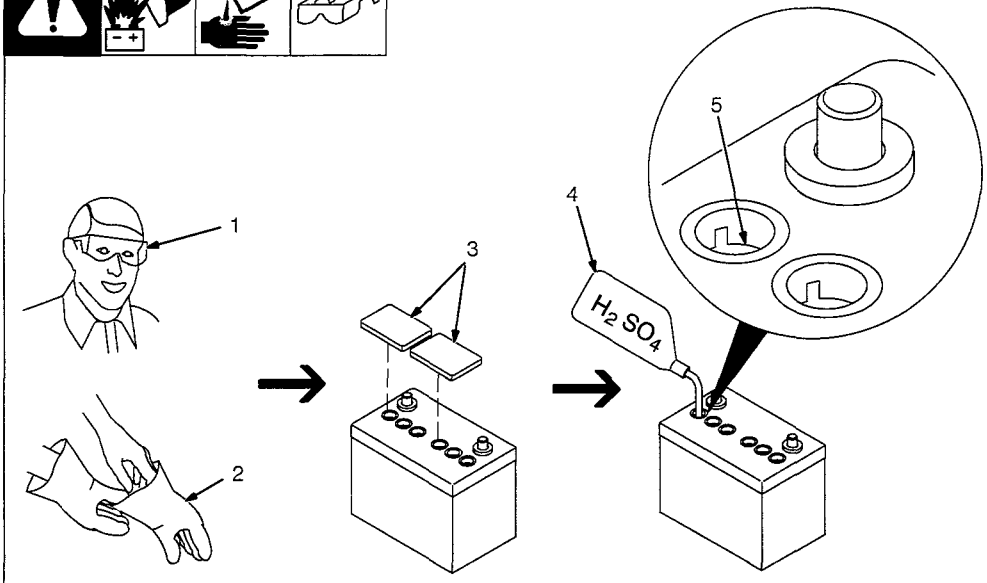
Keep battery in good condition. Store battery in warm area off concrete surface.

Use correct grade oil for cold weather.

802 339

4-4. Activating The Dry Charge Battery (If Applicable)





Remove battery from unit.

1 Eye Protection - Safety Glasses Or Face Shield

2 Rubber Gloves

3 Vent Caps

4 Sulfuric Acid Electrolyte (1.265 Specific Gravity)

5 Well

Fill each cell with electrolyte to **bottom** of well (maximum).

▲ **Do not overfill battery cells.**

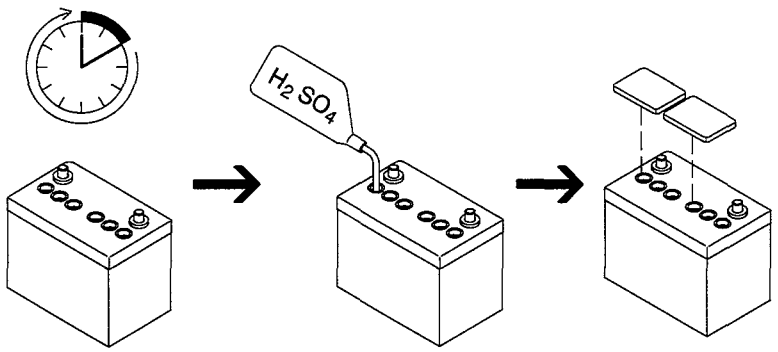
Wait ten minutes and check electrolyte level. If necessary, add electrolyte to raise to proper level. Reinstall vent caps.

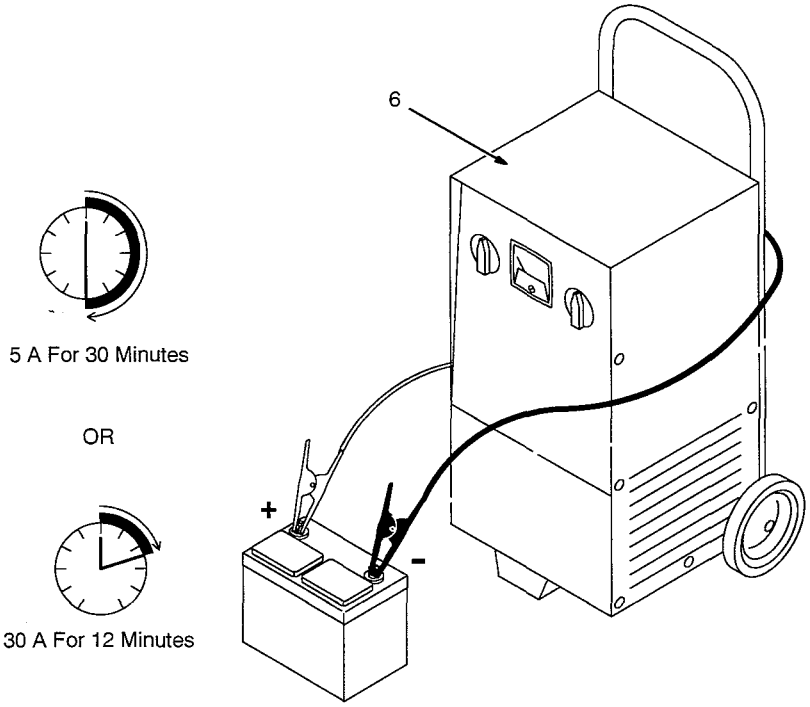
6 Battery Charger

▲ **Read and follow all instructions supplied with battery charger.**

Charge battery for 12 minutes at 30 amperes or 30 minutes at 5 amperes. Disconnect charging cables and install battery.

☞ *When electrolyte is low, add only distilled water to cells to maintain proper level.*



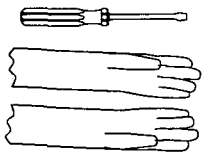


5 A For 30 Minutes

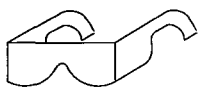
OR

30 A For 12 Minutes

Tools Needed:



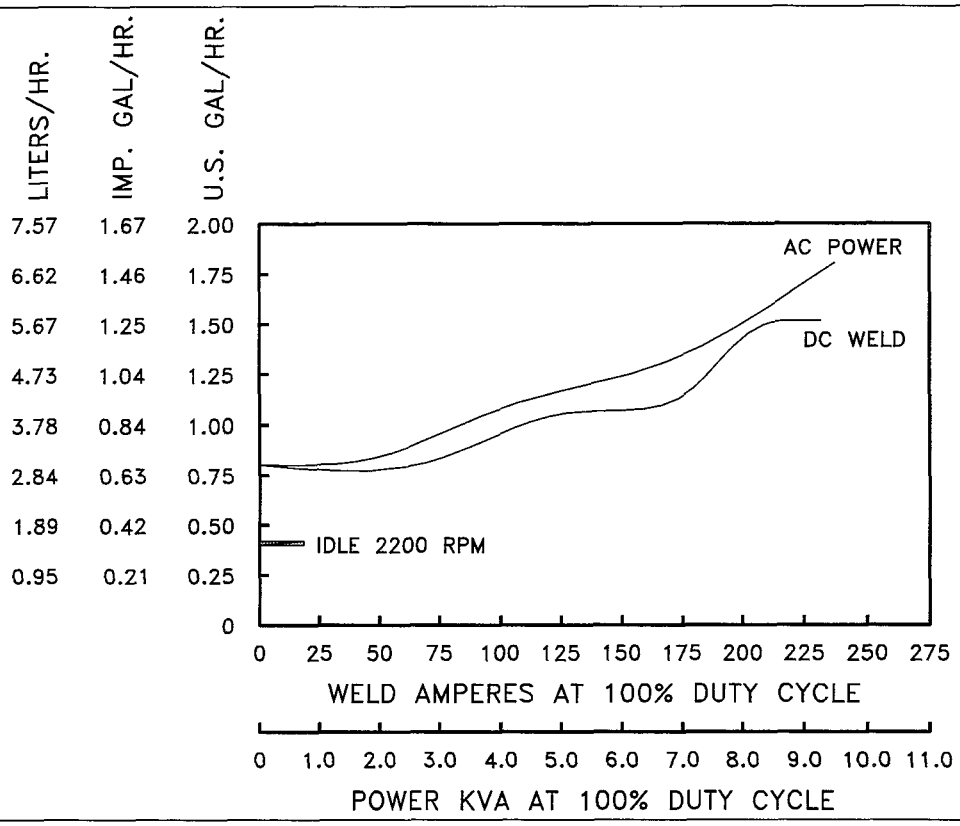
rubbergloves



glasses

drybatt1 1/98 - S-0886

3-4. Fuel Consumption (All Models)



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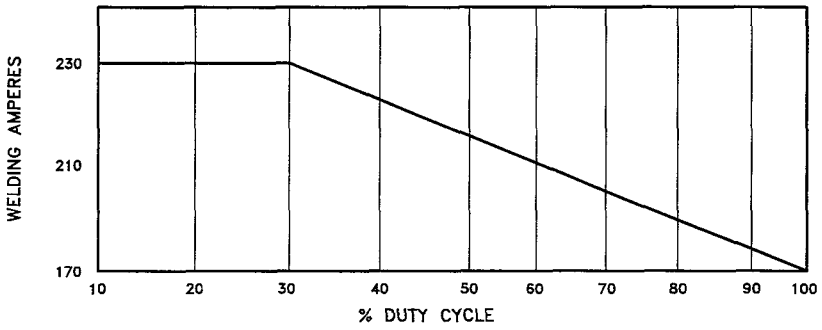
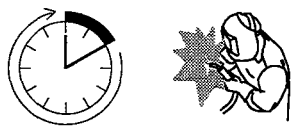
3-5. Duty Cycle

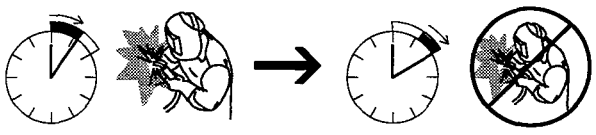
Duty cycle is the percentage of 10 minutes that unit can weld at rated load without overheating.

▲ **Exceeding duty cycle can damage unit and void warranty.**

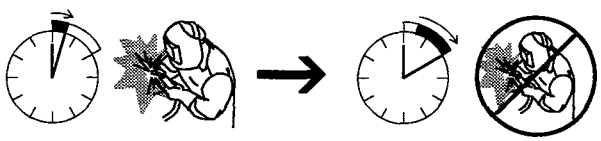




Continuous Welding
100% Duty Cycle at 170 Amperes CC/DC



6 Minutes Welding — 4 Minutes Resting
60% Duty Cycle at 210 Amperes CC/DC

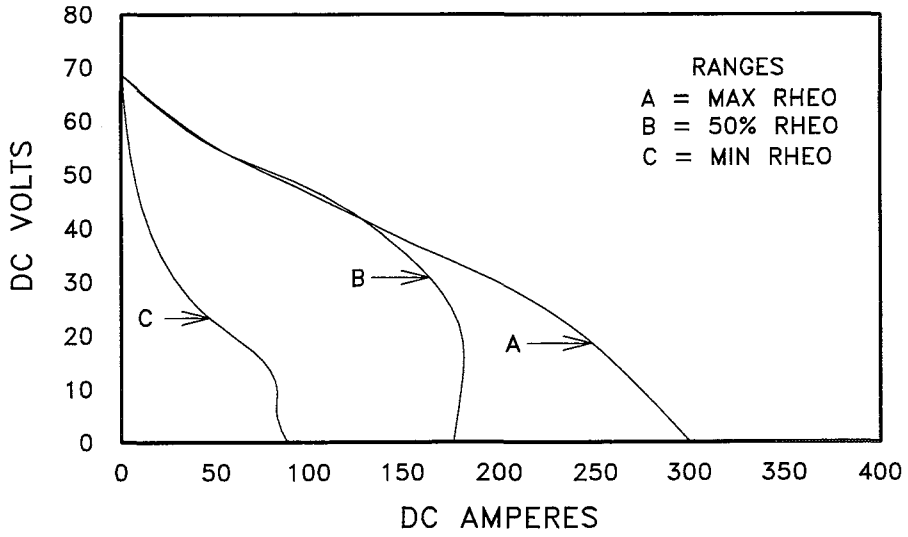


3 Minutes Welding — 7 Minutes Resting
30% Duty Cycle at 230 Amperes CC/DC

197 148

3-6. Volt-Ampere Curves

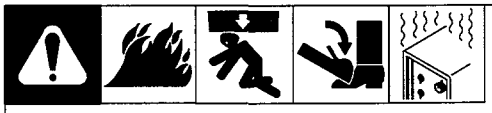
The volt-ampere curve shows the minimum and maximum voltage and amperage output capabilities of the welding generator. Curves of all other settings fall between the curves shown.



197 253

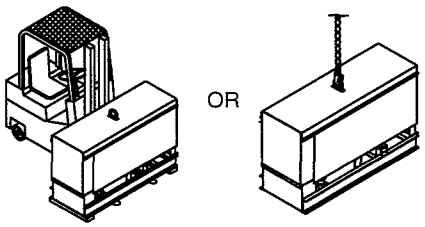
SECTION 4 - INSTALLATION

4-1. Installing Welding Generator

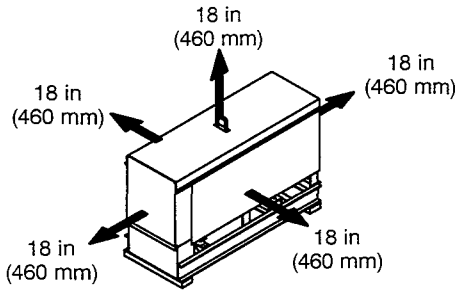


Movement

▲ **Do not lift unit from end.**



Airflow Clearance



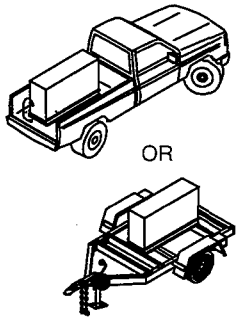
▲ **Do not weld on base. Welding on base can cause fuel tank fire or explosion. Bolt unit down using holes provided in base.**

1 Generator Base
2 Metal Vehicle Frame
3 Equipment Grounding Terminal
4 Grounding Cable

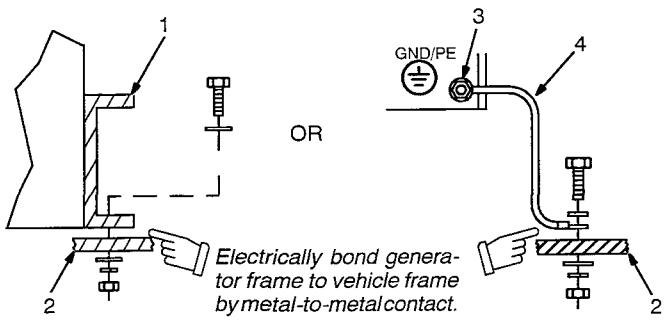
Use #10 AWG or larger insulated copper wire.

▲ **If unit does not have GFCI receptacles, use GFCI-protected extension cord.**

Location



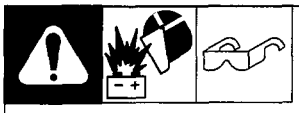
Grounding

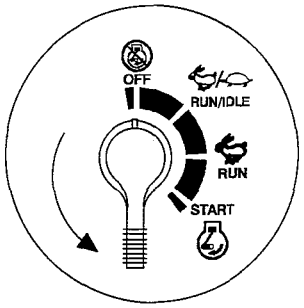


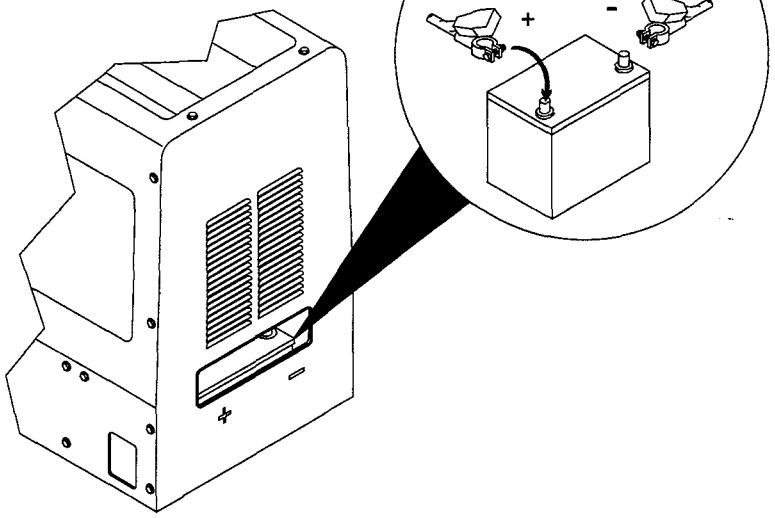
Electrically bond generator frame to vehicle frame by metal-to-metal contact.

install1 8/99 - Ref. 800 652 / Ref. 800 477-A / 158 936-A / S-0854

4-5. Connecting the Battery







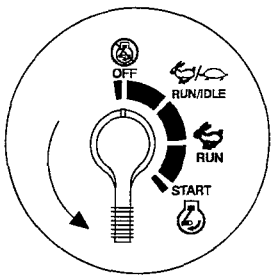
Tools Needed:

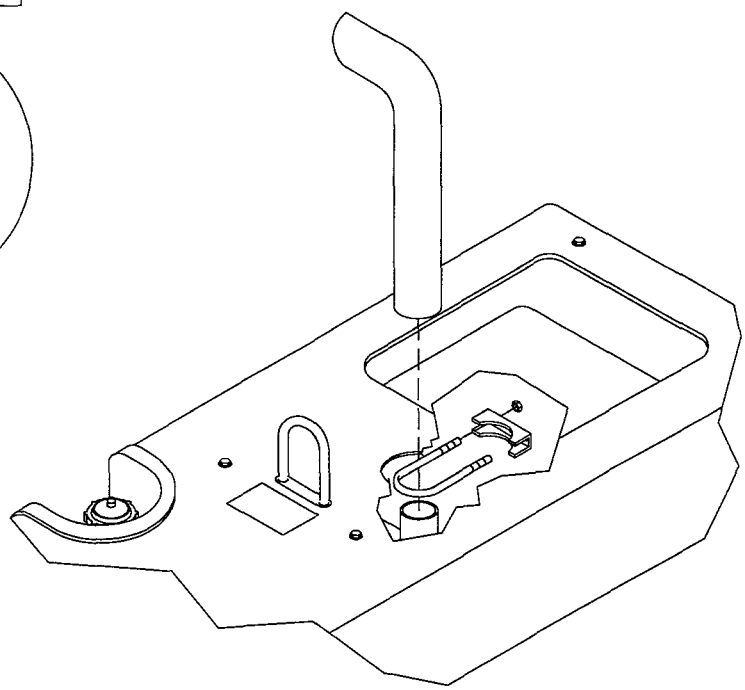
1/2 in

Ref. 194 024 / Ref. 802 341 / Ref. S-0756-D

4-6. Installing Exhaust Pipe

☞ *Point exhaust pipe in desired direction. If unit is truck or trailer mounted, point pipe away from direction of travel.*



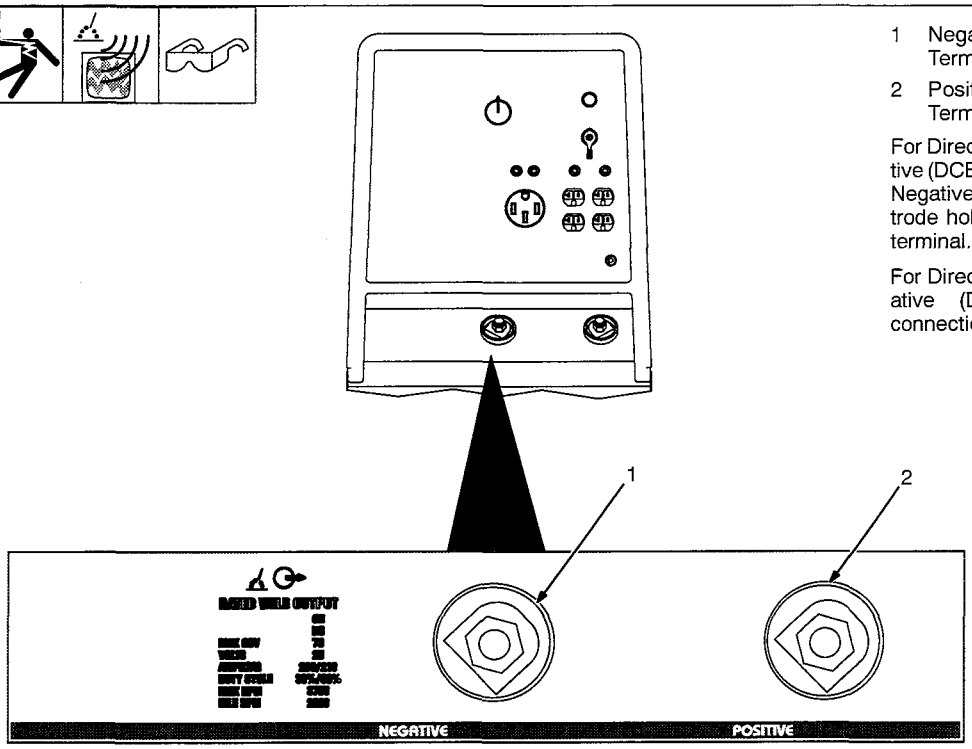


Tools Needed:

1/2 in

801 681 / Ref. 194 024

4-7. Connecting to Weld Output Terminals



1 Negative (-) Weld Output Terminal

2 Positive (+) Weld Output Terminal

For Direct Current Electrode Positive (DCEP), connect work cable to Negative (-) terminal and electrode holder cable to Positive (+) terminal.

For Direct Current Electrode Negative (DCEN), reverse cable connections.

Tools Needed:

3/4 in

Ref. 194 024

4-8. Selecting Weld Cable Sizes

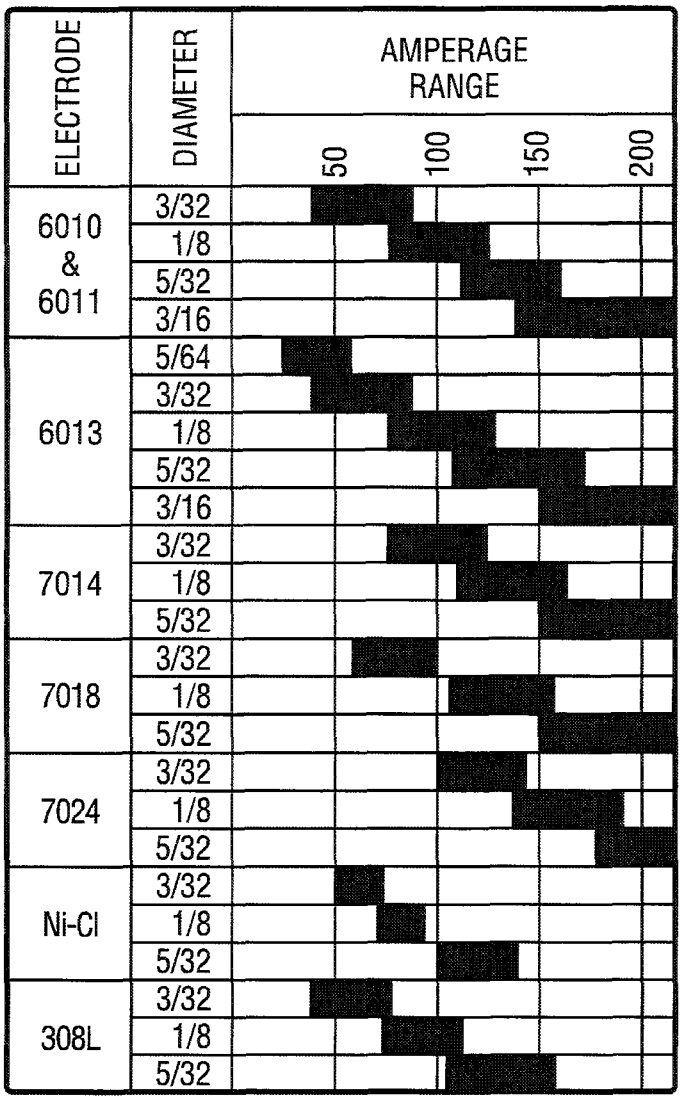
Welding Amperes	Total Cable (Copper) Length In Weld Circuit Not Exceeding							
	100 ft (30 m) Or Less		150 ft (45 m)	200 ft (60 m)	250 ft (70 m)	300 ft (90 m)	350 ft (105 m)	400 ft (120 m)
	10 - 60% Duty Cycle	60 - 100% Duty Cycle	10 - 100% Duty Cycle					
100	4	4	4	3	2	1	1/0	1/0
150	3	3	2	1	1/0	2/0	3/0	3/0
200	3	2	1	1/0	2/0	3/0	4/0	4/0
250	2	1	1/0	2/0	3/0	4/0	2-2/0	2-2/0
300	1	1/0	2/0	3/0	4/0	2-2/0	2-3/0	2-3/0
350	1/0	2/0	3/0	4/0	2-2/0	2-3/0	2-3/0	2-4/0
400	1/0	2/0	3/0	4/0	2-2/0	2-3/0	2-4/0	2-4/0
500	2/0	3/0	4/0	2-2/0	2-3/0	2-4/0	3-3/0	3-3/0

*Weld cable size (AWG) is based on either a 4 volts or less drop or a current density of at least 300 circular mils per ampere. Contact your distributor for the mm^2 equivalent weld cable sizes.

S-0007-E

4-9. Amperage Selection Table For Stick (SMAW) Electrodes

☞ *Use table on front panel to select correct amperage for the electrode being used.*



Ref. 194 024

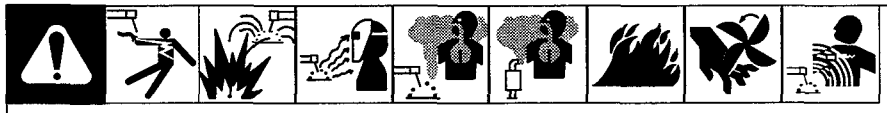
SECTION 5 - OPERATING THE WELDING GENERATOR

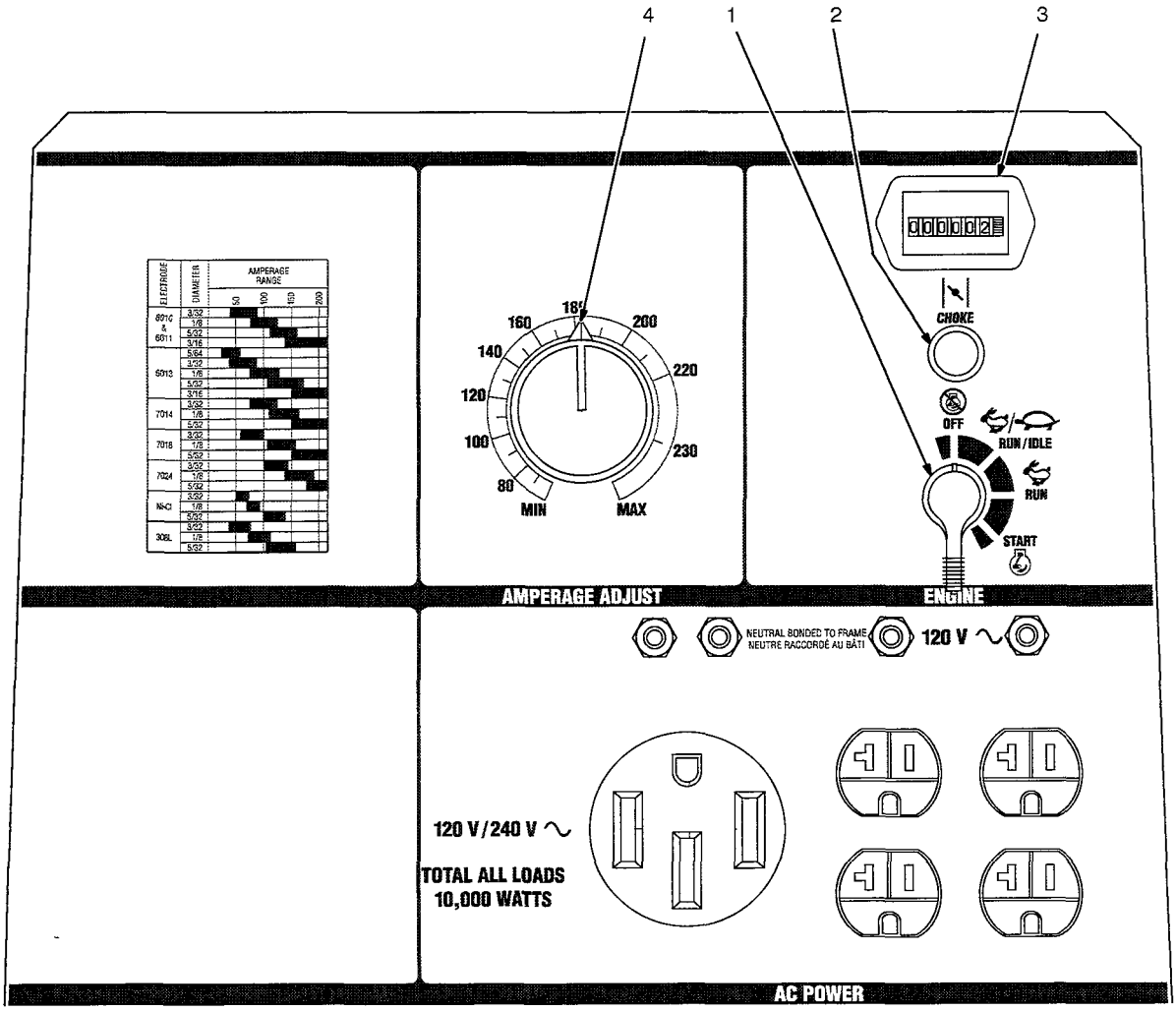
NOTE ☞

If the unit is extremely overloaded, weld and auxiliary power will stop. Turn unit off and restart to reset the generator protection circuit and restore weld and auxiliary power output.

If the rated output of the unit is exceeded, engine speed may vary rapidly until the weld or auxiliary power load is reduced.

5-1. Front Panel Controls





Ref. 194 024

1 Engine Control Switch

Use switch to start engine, select speed, and stop engine. In Run/Idle position, engine runs at idle speed at no load, and weld/power speed under load. In Run position, engine runs at weld/power speed.

2 Engine Choke Control

Use control to change engine air-fuel mix.

To Start: pull out choke and turn Engine Control switch to Start position. Release switch and slowly push choke in when engine starts.

☞ *If the engine does not start, let the engine come to a complete stop before attempting restart.*

To Stop: turn Engine Control switch to Off position.

3 Engine Hour Meter

4 Amperage Control

Use control to select weld amperage. Select amperage according to electrode being used (see Section 4-9). Control may be adjusted while welding. Control does not affect auxiliary power output.

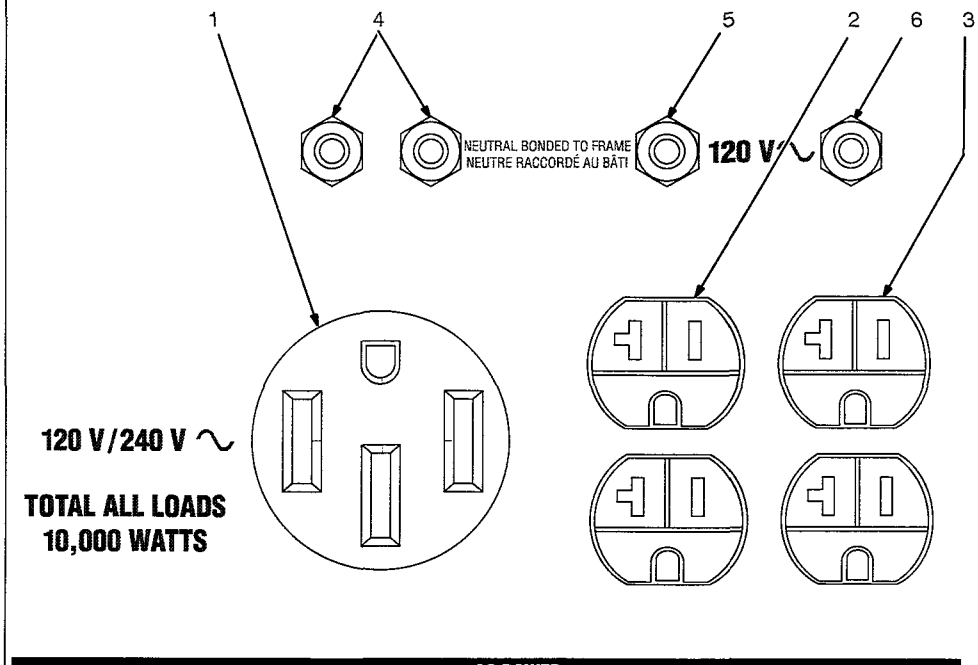
SECTION 6 - OPERATING AUXILIARY EQUIPMENT

NOTE ☞

If the unit is extremely overloaded, weld and auxiliary power will stop. Turn unit off and restart to reset the generator protection circuit and restore weld and auxiliary power output.

If the rated output of the unit is exceeded, engine speed may vary rapidly until the weld or auxiliary power load is reduced.

6-1. Standard Receptacles



AC POWER

▲ **If unit does not have GFCI receptacles, use GFCI-protected extension cord.**

1 120/240 V 50 A AC Receptacle RC1

RC1 supplies 60 Hz single-phase power at weld/power speed. Maximum output is 10 kVA/kW.

2 120 V 20 A AC Duplex Receptacle RC2

3 120 V 20 A AC Duplex Receptacle RC3

RC2 and RC3 supply 60 Hz single-phase power at weld/power speed. Maximum output from RC2 or RC3 is 2.4 kVA/kW.

4 Circuit Breakers CB1 and CB2

CB1 and CB2 protect RC1 from overload. If CB1 or CB2 opens, RC1 and one of the 120 volt receptacles does not work. 120 volts may still be present at RC1.

5 Circuit Breaker CB3

6 Circuit Breaker CB4

CB3 protects RC2 and CB4 protects RC3 from overload. If a circuit breaker opens, the receptacle does not work.

☞ *Press button to reset circuit breaker. If breaker continues to open, contact Factory Authorized Service Agent.*

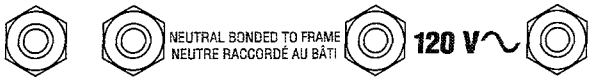
Combined output of all receptacles limited to 10 kVA/kW rating of the generator.

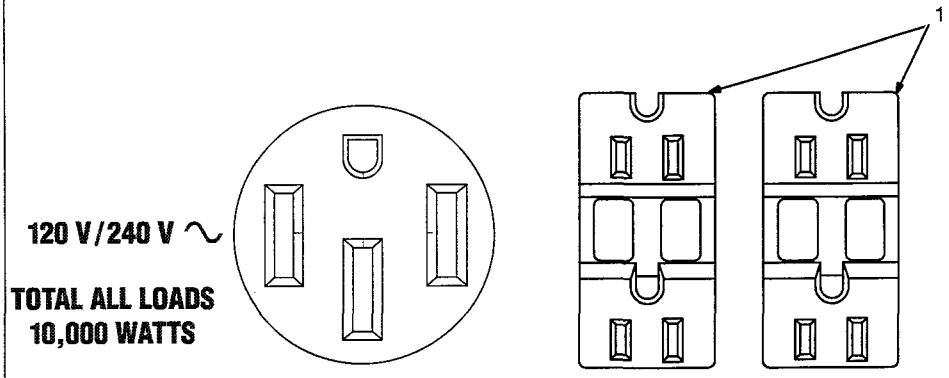
EXAMPLE: If 20 A is drawn from each 120 V duplex receptacle, only 21 A is available at the 240V receptacle:

2 x (120 V x 20 A) + (240 V x 21 A) = 10 kVA/kW (approx.).

Ref. 183 175-A

6-2. Optional Auxiliary Power Receptacles





AC POWER

▲ If unit does not have GFCI receptacles, use GFCI-protected extension cord.

Combined output of all receptacles limited to 10 kVA/kW rating of the generator.

GFCI Receptacle Option

1 120 V 15 A AC GFCI Receptacles GFCI2 and GFCI3

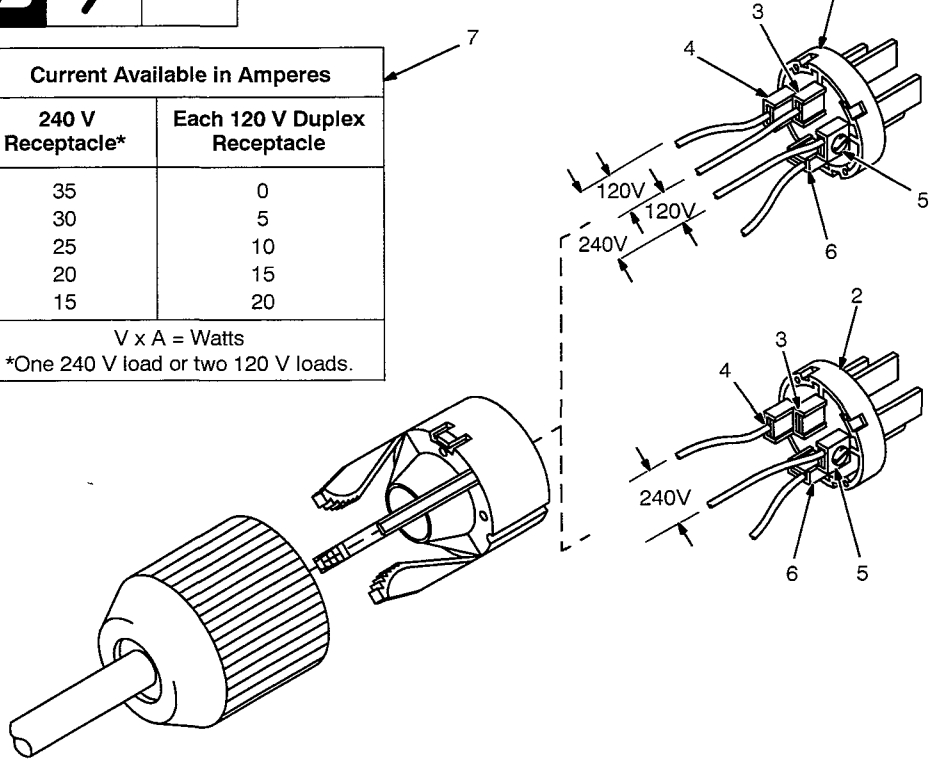
GFCI2 and GFCI3 supply 60 Hz single-phase power at weld/power speed. Maximum output from GFCI2 or GFCI3 is 2.4 kVA/kW. Circuit breaker protection is the same as standard receptacles.

If a ground fault is detected, the GFCI Reset button pops out and the circuit opens to disconnect the faulty equipment. Check for damaged tools, cords, plugs, etc. connected to the receptacle. Press button to reset receptacle and resume operation.

☞ *At least once a month, run engine at weld/power speed and press Test button to verify GFCI is working properly.*

6-3. Wiring Optional 240 Volt Plug

Current Available in Amperes	
240 V Receptacle*	Each 120 V Duplex Receptacle
35	0
30	5
25	10
20	15
15	20
V x A = Watts *One 240 V load or two 120 V loads.	



The plug can be wired for a 240 V, 2-wire load or a 120/240V, 3-wire load. See circuit diagram.

1 Plug Wired for 120/240 V, 3-Wire Load

When wired for 120 V loads, each duplex receptacle shares a load with one half of 240 V receptacle.

2 Plug Wired for 240 V, 2-Wire Load

3 Neutral (Silver) Terminal

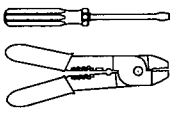
4 Load 1 (Brass)Terminal

5 Load 2 (Brass) Terminal

6 Ground (Green) Terminal

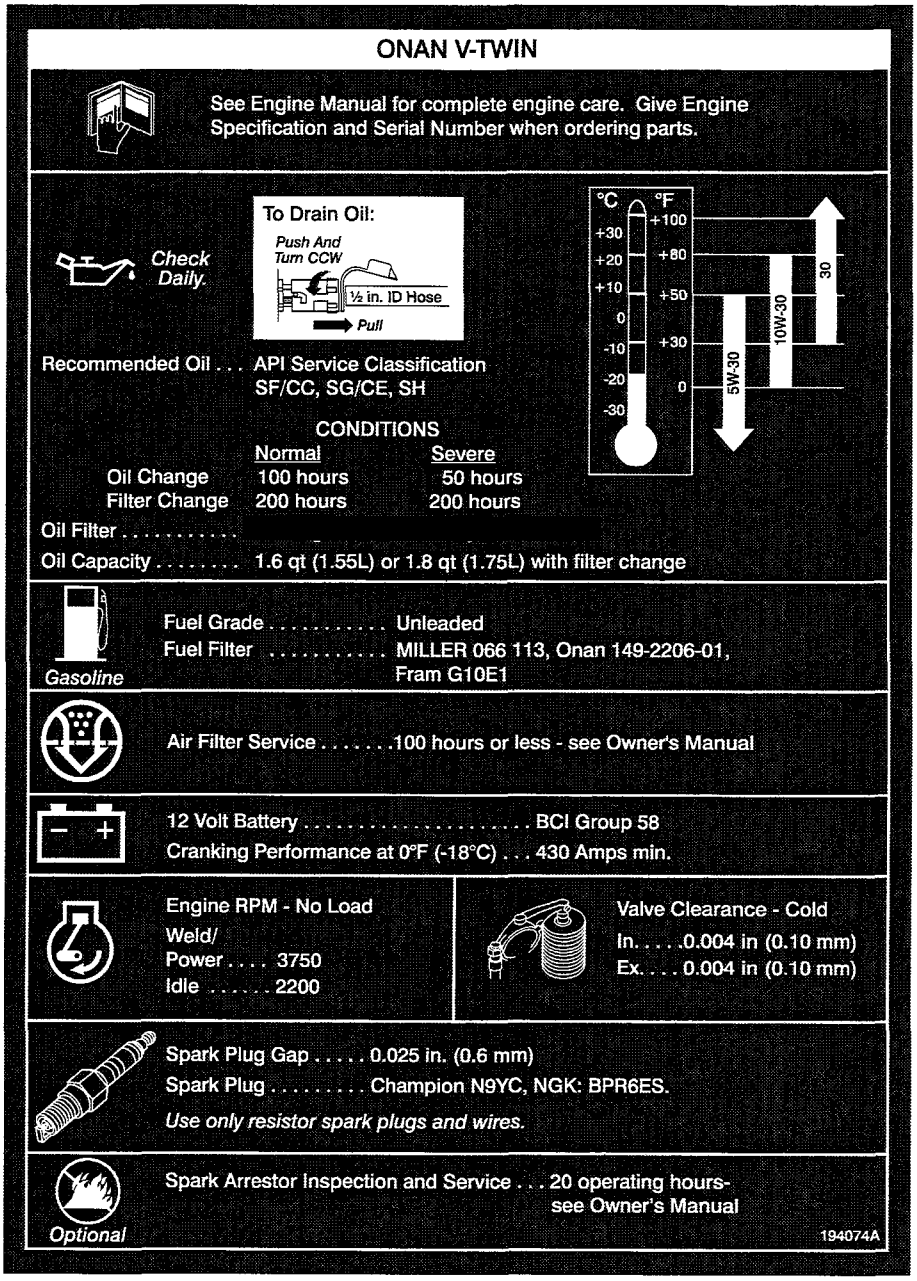
7 Amperes Available Using 120/240 V Plug

Tools Needed:



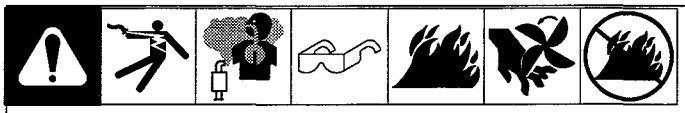
120 813-D

7-1. Maintenance Label (Onan-Powered Units)


ONAN V-TWIN
See Engine Manual for complete engine care. Give Engine Specification and Serial Number when ordering parts.
Check Daily.
To Drain Oil:
Push And Turn CCW
½ in. ID Hose
Pull
°C
°F
+30
+20
+10
0
-10
-20
-30
+100
+80
+50
+30
0
30
10W-30
5W-30
Recommended Oil . . . API Service Classification SF/CC, SG/CE, SH
CONDITIONS
Normal
Severe
Oil Change 100 hours 50 hours
Filter Change 200 hours 200 hours
Oil Filter . . . . . .
Oil Capacity . . . . . 1.6 qt (1.55L) or 1.8 qt (1.75L) with filter change
Gasoline
Fuel Grade . . . . . Unleaded
Fuel Filter . . . . . MILLER 066 113, Onan 149-2206-01, Fram G10E1
Air Filter Service . . . . . .100 hours or less - see Owner's Manual
12 Volt Battery . . . . . BCI Group 58
Cranking Performance at 0°F (-18°C) . . . 430 Amps min.
Engine RPM - No Load
Weld/
Power 3750
Idle 2200
Valve Clearance - Cold
In. . . . .0.004 in (0.10 mm)
Ex. . . . 0.004 in (0.10 mm)
Spark Plug Gap . . . . . 0.025 in. (0.6 mm)
Spark Plug . . . . . Champion N9YC, NGK: BPR6ES.
Use only resistor spark plugs and wires.
Optional
Spark Arrestor Inspection and Service . . . 20 operating hours- see Owner's Manual
194074A

7-2. Routine Maintenance (Onan-Powered Units)

Note ☞ *Follow the storage procedure in the engine owner's manual if the unit will not be used for an extended period.*



Recycle engine fluids.

▲ **Stop engine before maintaining.**

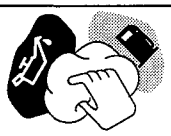
☞ *See also Engine Manual and maintenance label. Service engine more often if used in severe conditions.*

* To be done by Factory Authorized Service Agent.

8 h

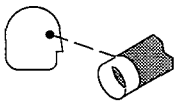
Check fluid levels. See Section 4-2.

Wipe up spills.



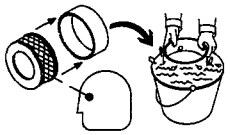
20 h

Check and clean spark arrestor screen. See Section 7-5.



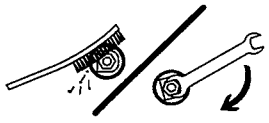
25 h

Service air cleaner wrapper (foam element). See Section 7-3.



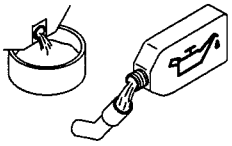
50 h

Clean and tighten weld terminals.

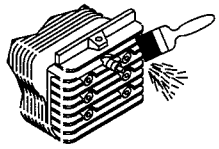


100 h

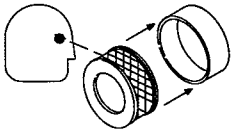
Change oil. See Section 7-6 and maintenance label.



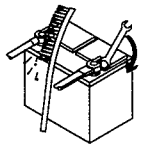
Clean cooling system. See Engine Manual.



Service air cleaner element. See Section 7-3.

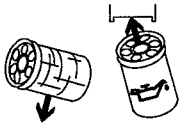


Clean and tighten battery connections.

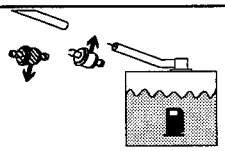


200 h

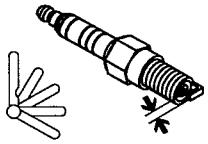
Change oil filter. See Section 7-6 and maintenance label.



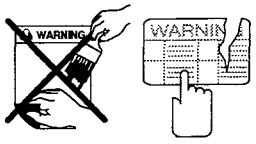
Replace fuel filter. See Section 7-6.



Check spark plugs.

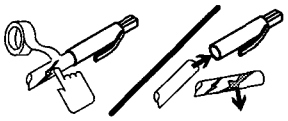


Replace unreadable labels.

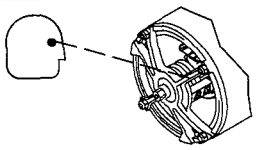


500 h

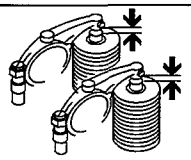
Repair or replace cracked cables.



Service welding generator brushes and slip rings. Service more often in dirty conditions.*

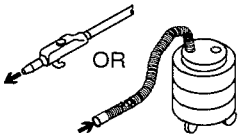


Check valve clearance.*

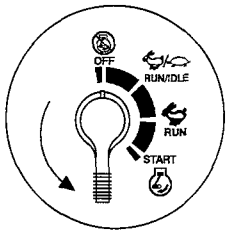


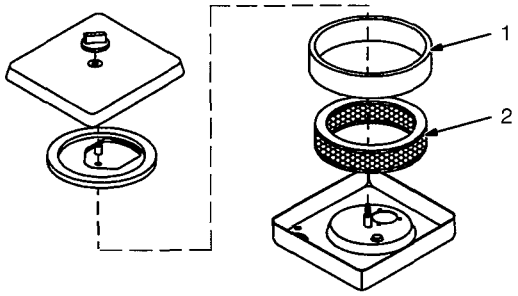
1000 h

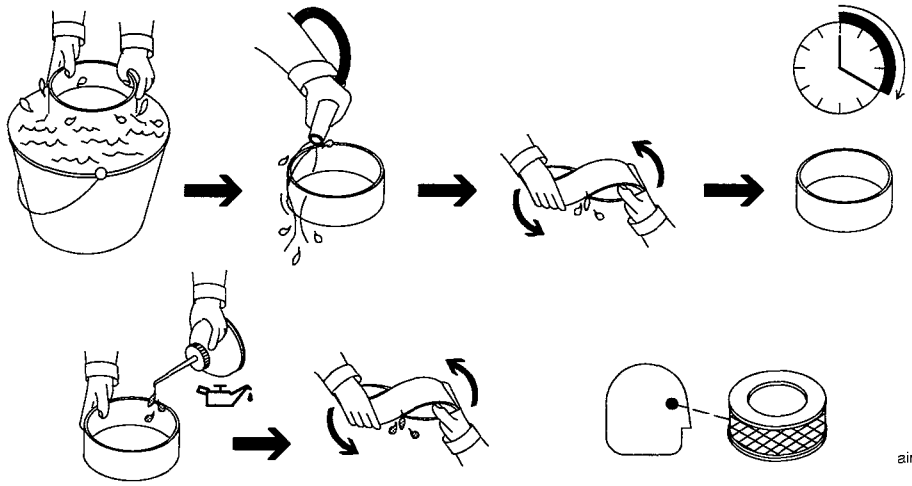
Blow out or vacuum inside. During heavy service, clean monthly.



7-3. Servicing Air Cleaner (Onan-Powered Units)







▲ **Stop engine.**

▲ **Do not run engine without air cleaner or with dirty element.**

1 Wrapper (Foam Element)

Wash wrapper with soap and water solution. Allow wrapper to air dry completely.

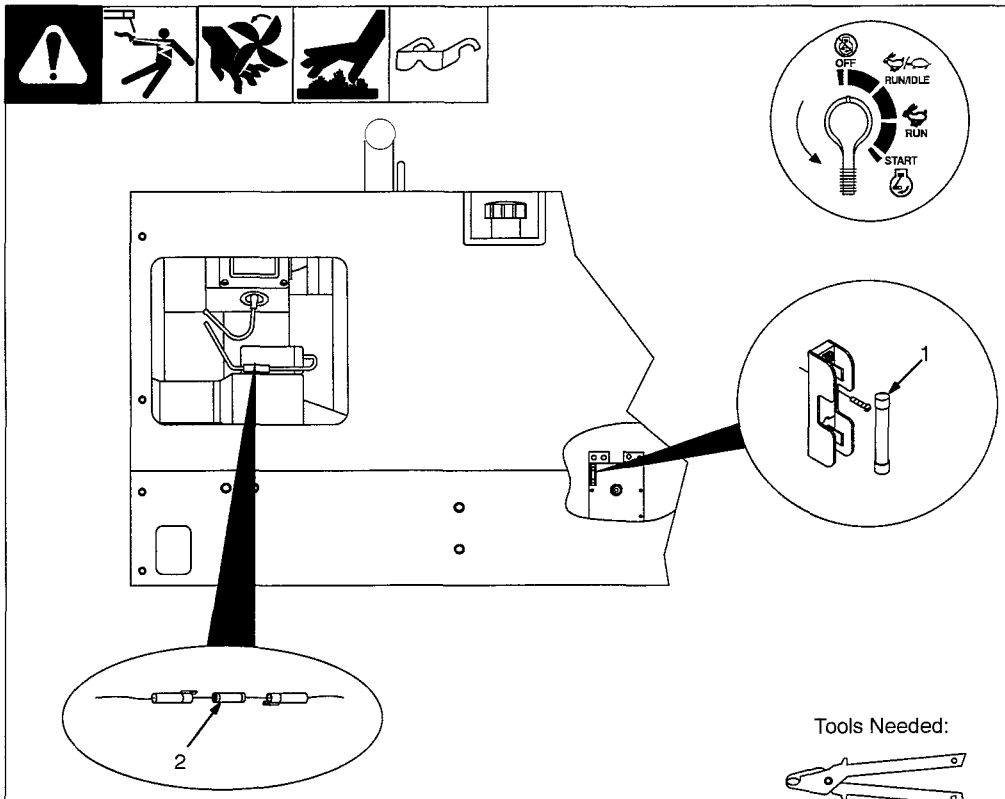
Spread 1 tablespoon SAE 30 oil evenly into wrapper. Squeeze out excess oil.

2 Element

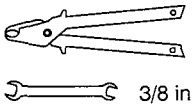
Replace element if dirty, oily, or damaged.

aircleaner3 1/97 - 156 852 / Ref. 183 175-A / S-0759

7-4. Overload Protection (Onan-Powered Units)



Tools Needed:



▲ **Stop engine. Disconnect negative (-) battery cable.**

☞ *If the unit is extremely overloaded, weld and auxiliary power will stop. Turn unit off and restart to reset the generator protection circuit and restore weld and auxiliary power output.*

If the rated output of the unit is exceeded, engine speed may vary rapidly until the weld or auxiliary power load is reduced.

1 Fuse F1 (See Parts List)

F1 protects the exciter excitation winding from overload. If F1 opens, there is no/low weld and auxiliary power output.

2 Fuse F6 (See Parts List)

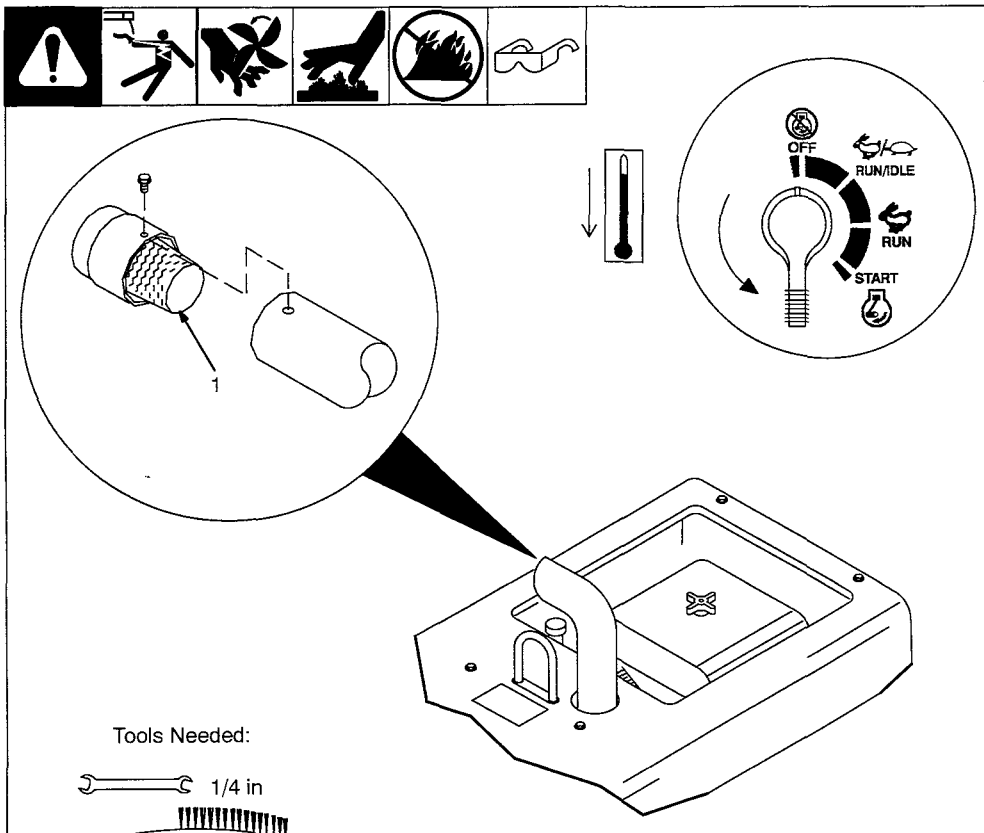
F6 protects the engine wiring system from overload. If F6 opens, engine will not crank.

Replace any open fuses. Reinstall cover before operating.

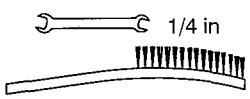
☞ *If a fuse opens, it usually indicates a more serious problem exists. Contact a Factory Authorized Service Agent.*

802 342

7-5. Servicing Optional Spark Arrestor (Onan-Powered Units)



Tools Needed:



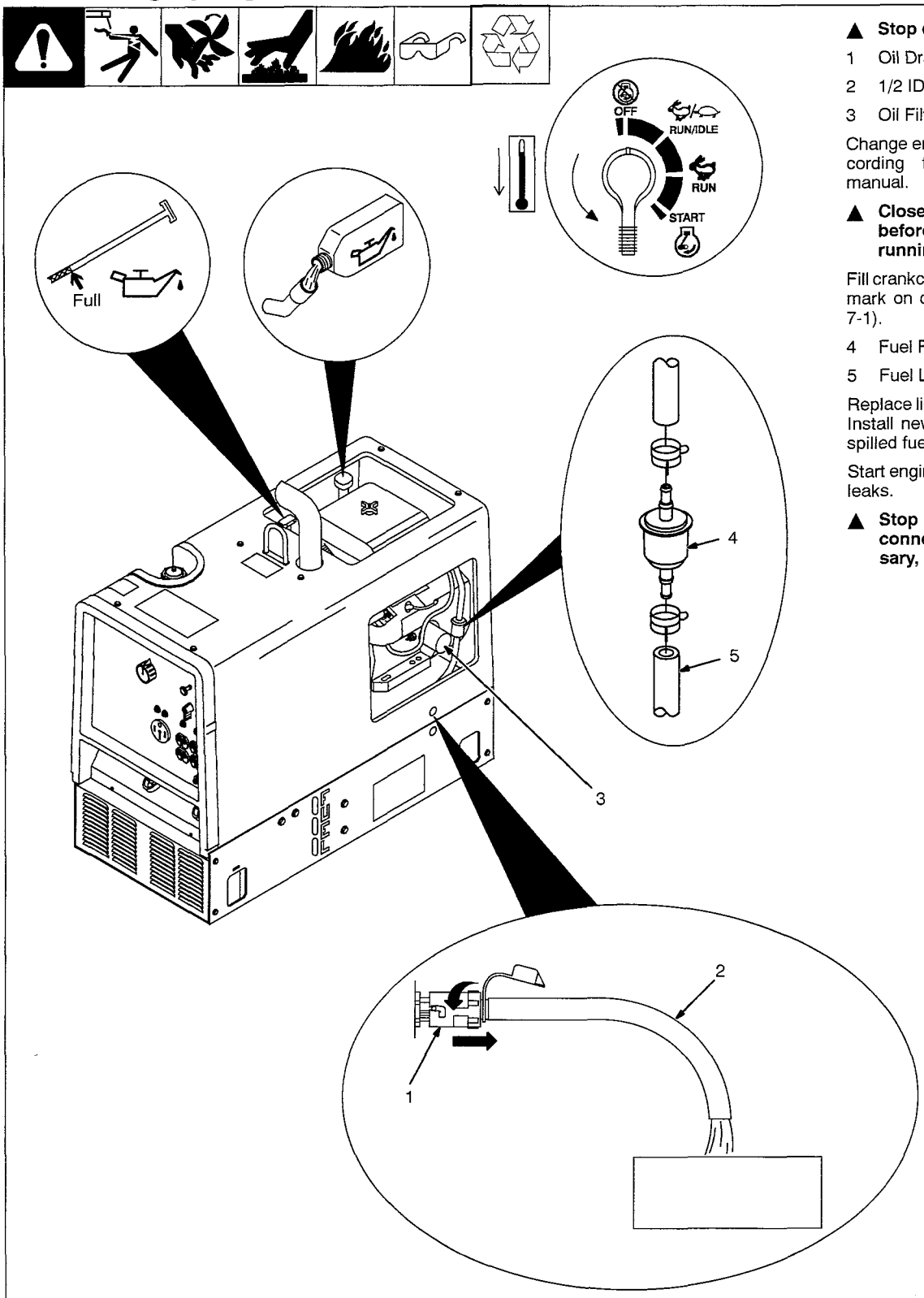
▲ **Stop engine and let cool.**

1 Spark Arrestor Screen

Clean and inspect screen. Replace spark arrestor if screen wires are broken or missing.

Ref. 801 682-A / Ref. 802 353

7-6. Changing Engine Oil, Oil Filter, and Fuel Filter (Onan-Powered Units)



▲ **Stop engine and let cool.**

1 Oil Drain Valve

2 1/2 ID x 7 in Hose

3 Oil Filter

Change engine oil and filter according to engine owner's manual.

▲ **Close valve and valve cap before adding oil and running engine.**

Fill crankcase with new oil to full mark on dipstick (see Section 7-1).

4 Fuel Filter

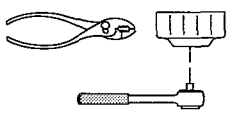
5 Fuel Line

Replace line if cracked or worn. Install new filter. Wipe up any spilled fuel.

Start engine, and check for fuel leaks.

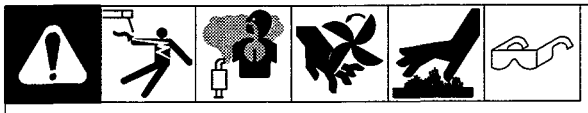
▲ **Stop engine, tighten connections as necessary, and wipe up fuel.**

Tools Needed:

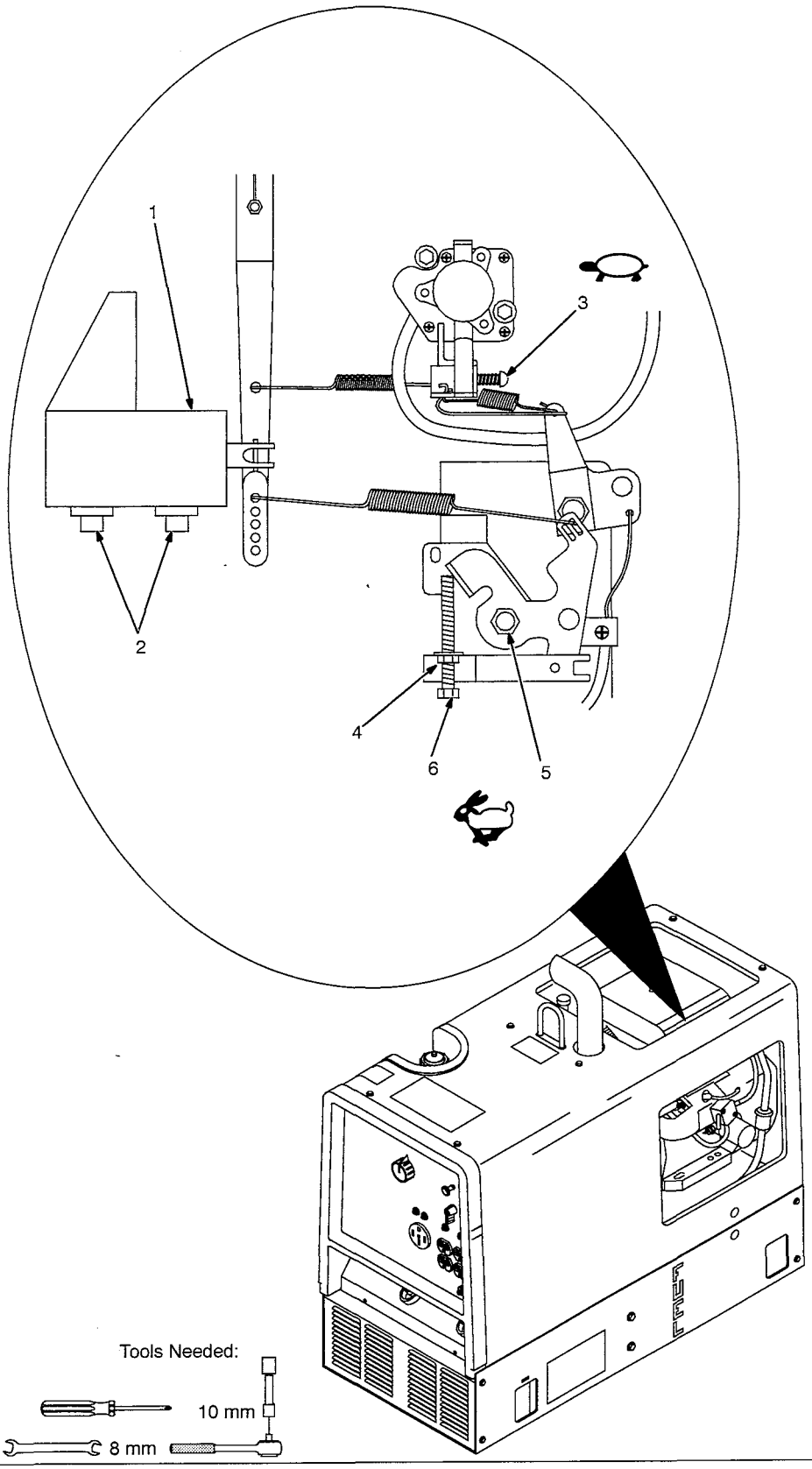


802 353 / S-0842

7-7. Adjusting Engine Speed (Onan-Powered Units)



	2200 ± 100 rpm
	3700 ± 50 rpm



After tuning engine, check engine speeds with a tachometer (see table). If necessary, adjust speeds as follows:

Start engine and run until warm.

Remove wrapper to access speed adjustments.

Idle Speed Adjustment

Move Engine Control switch to Run/Idle position.

1 Throttle Solenoid

2 Mounting Screws

3 Idle Speed Screw

Loosen mounting screws. Adjust solenoid position so engine runs at idle speed. If necessary, back out idle speed screw so solenoid can be moved to correct position. Tighten mounting screws. Be sure solenoid linkage works smoothly.

Turn idle speed screw for fine adjustments.

Weld/Power Speed Adjustment

Move Engine Control switch to Run position.

4 Jam Nut

5 Lock Nut

6 Weld/Power Speed Adjustment Screw

Loosen jam nut and lock nut. Turn adjustment screw until engine runs at weld/power speed. Tighten jam nut, and then tighten lock nut.

▲ **Stop engine.**

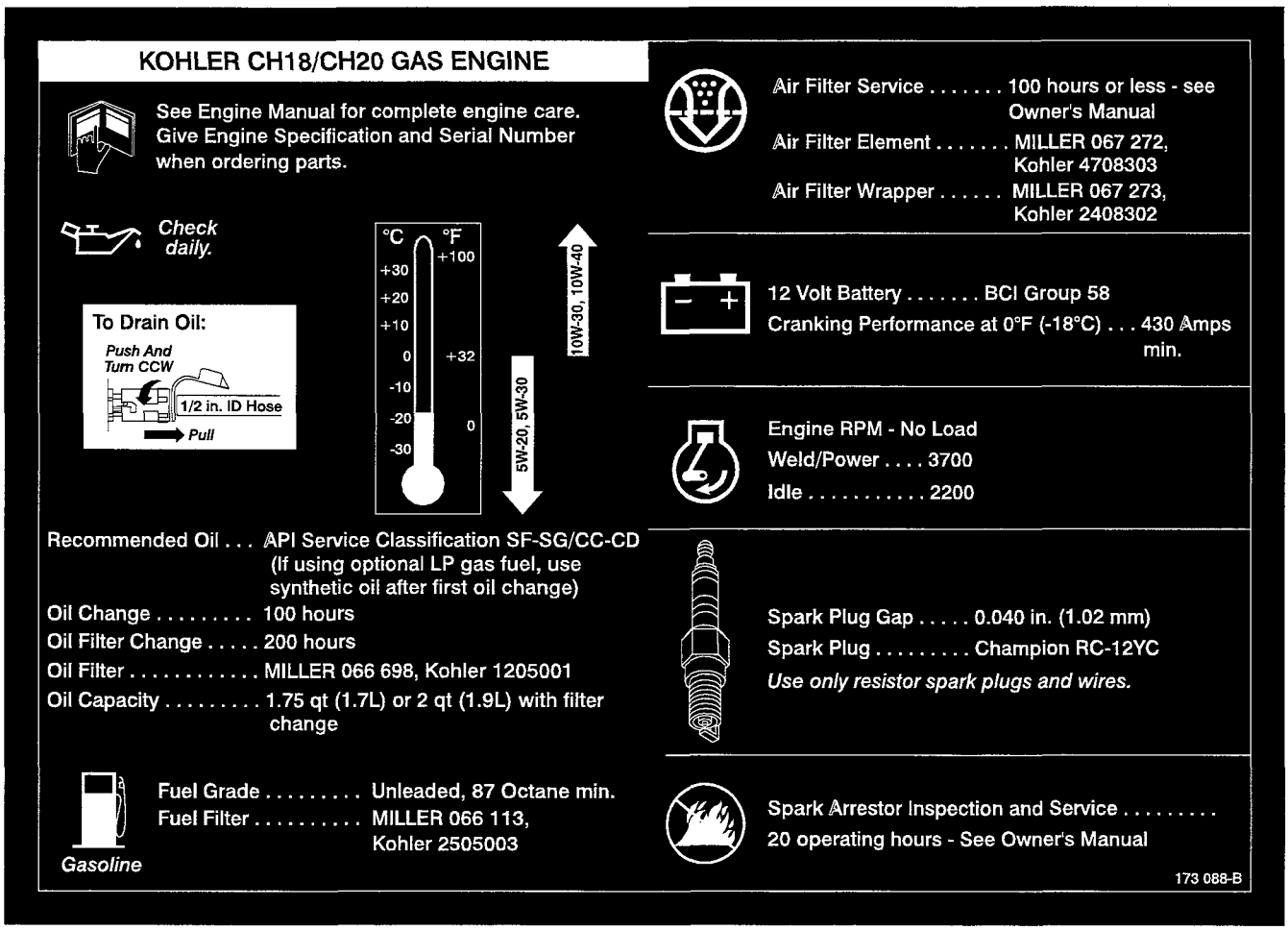
Reinstall wrapper.

Tools Needed:

802 353 / 802 457

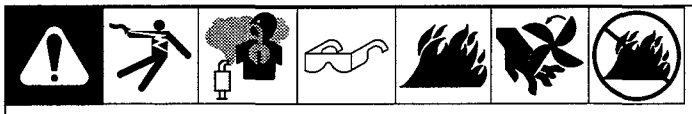
SECTION 8 - MAINTENANCE - (KOHLER-POWERED UNITS)

8-1. Maintenance Label (Kohler-Powered Units)


KOHLER CH18/CH20 GAS ENGINE
See Engine Manual for complete engine care.
Give Engine Specification and Serial Number when ordering parts.
Check daily.
To Drain Oil:
Push And Turn CCW
1/2 in. ID Hose
Pull
°C °F
+30 +100
+20
+10
0 +32
-10
-20 0
-30
10W-30, 10W-40
5W-20, 5W-30
Recommended Oil . . . API Service Classification SF-SG/CC-CD (If using optional LP gas fuel, use synthetic oil after first oil change)
Oil Change . . . . . 100 hours
Oil Filter Change . . . . . 200 hours
Oil Filter . . . . . MILLER 066 698, Kohler 1205001
Oil Capacity . . . . . 1.75 qt (1.7L) or 2 qt (1.9L) with filter change
Gasoline
Fuel Grade . . . . . Unleaded, 87 Octane min.
Fuel Filter . . . . . MILLER 066 113, Kohler 2505003
Air Filter Service . . . . . 100 hours or less - see Owner's Manual
Air Filter Element . . . . . MILLER 067 272, Kohler 4708303
Air Filter Wrapper . . . . . MILLER 067 273, Kohler 2408302
12 Volt Battery . . . . . BCI Group 58
Cranking Performance at 0°F (-18°C) . . . 430 Amps min.
Engine RPM - No Load
Weld/Power 3700
Idle 2200
Spark Plug Gap . . . . . 0.040 in. (1.02 mm)
Spark Plug . . . . . Champion RC-12YC
Use only resistor spark plugs and wires.
Spark Arrestor Inspection and Service . . . . . 20 operating hours - See Owner's Manual
173 088-B

8-2. Routine Maintenance (Kohler-Powered Units)

Note ☞ *Follow the storage procedure in the engine owner's manual if the unit will not be used for an extended period.*



Recycle engine fluids.

▲ **Stop engine before maintaining.**

☞ *See also Engine Manual and maintenance label. Service engine more often if used in severe conditions.*

* To be done by Factory Authorized Service Agent.

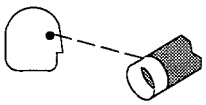
8 h

Wipe up spills.

Check fluid levels. See Section 4-2.

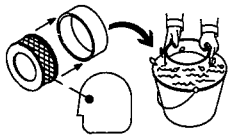
20 h

Check and clean optional spark arrestor screen. See Section 8-5.



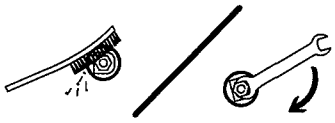
25 h

Service air cleaner wrapper (foam element). See Section 8-3.



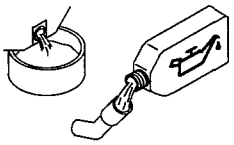
50 h

Clean and tighten weld terminals.

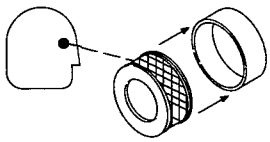


100 h

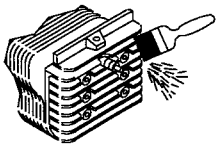
Change oil. See Section 8-6 and maintenance label.



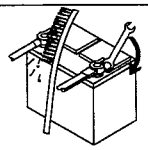
Check air cleaner element. See Section 8-3.



Clean cooling system. See Engine Manual.

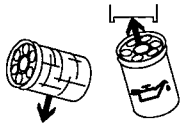


Clean and tighten battery connections.

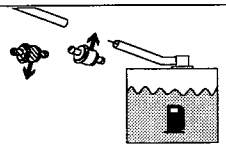


200 h

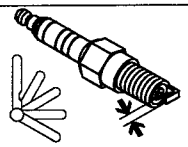
Change oil filter. See Section 8-6 and maintenance label.



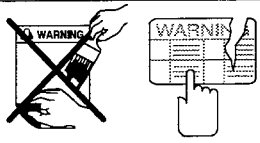
Replace fuel filter. See Section 8-6.



Check spark plugs.

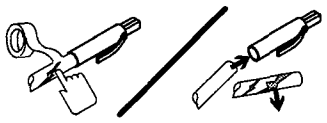


Replace unreadable labels.

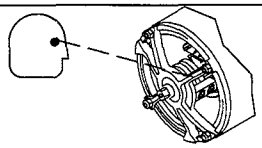


500 h

Repair or replace cracked cables.

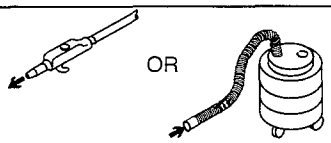


Service welding generator brushes and slip rings. Service more often in dirty conditions.*

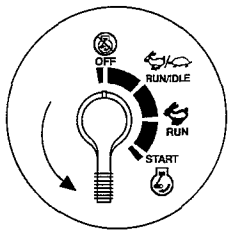


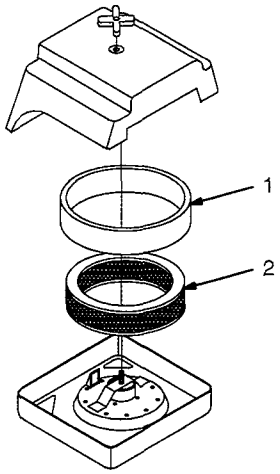
1000 h

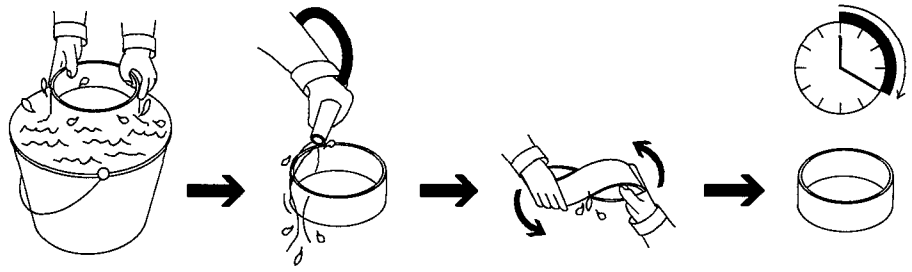
Blow out or vacuum inside. During heavy service, clean monthly.

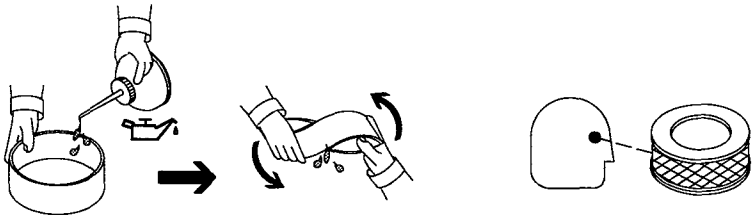


8-3. Servicing Air Cleaner (Kohler-Powered Units)









▲ **Stop engine.**

▲ **Do not run engine without air cleaner or with dirty element.**

1 Wrapper (Foam Element)

Wash wrapper with soap and water solution. Allow wrapper to air dry completely.

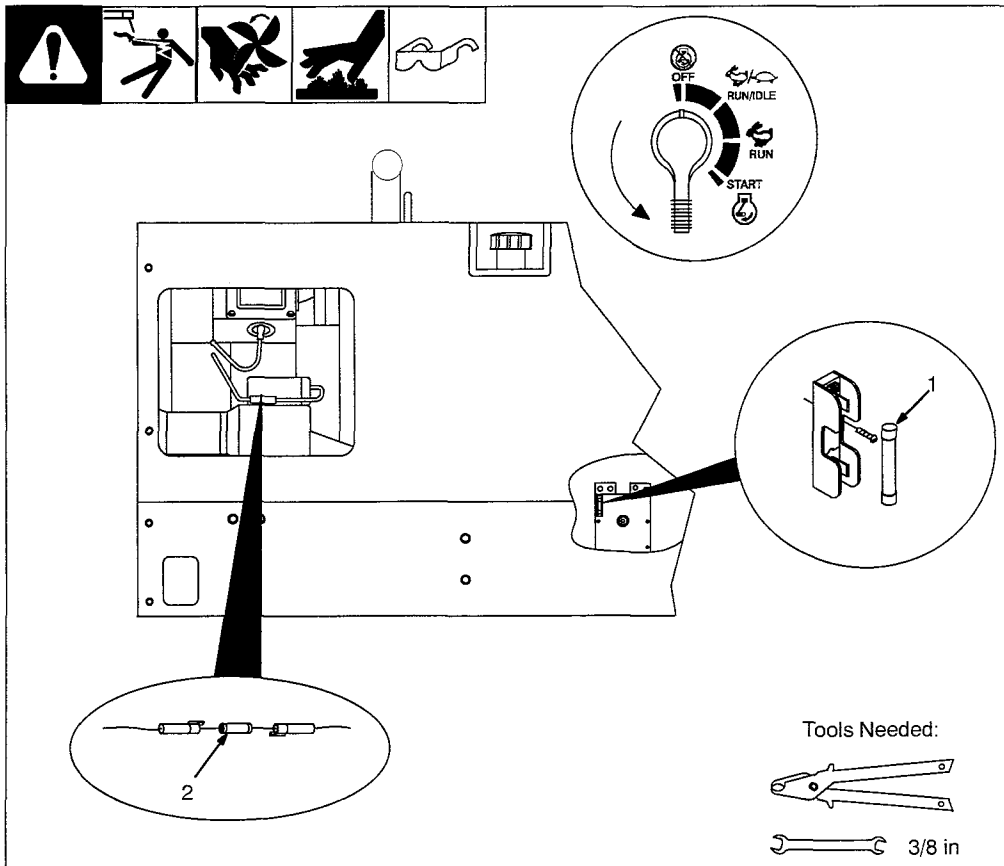
Spread 1 tablespoon SAE 30 oil evenly into wrapper. Squeeze out excess oil.

2 Element

Replace element if dirty, oily, or damaged.

aircleaner3 1/97 - 802 487 / Ref. 183 175-A / S-0759

8-4. Overload Protection (Kohler-Powered Units)



Tools Needed:

▲ **Stop engine.**

☞ *If the unit is extremely overloaded, weld and auxiliary power will stop. Turn unit off and restart to reset the generator protection circuit and restore weld and auxiliary power output.*

If the rated output of the unit is exceeded, engine speed may vary rapidly until the weld or auxiliary power load is reduced.

1 Fuse F1 (See Parts List)

F1 protects the generator excitation circuit. If F1 opens, there will be no/low weld and auxiliary power output.

2 Fuse F6 (See Parts List)

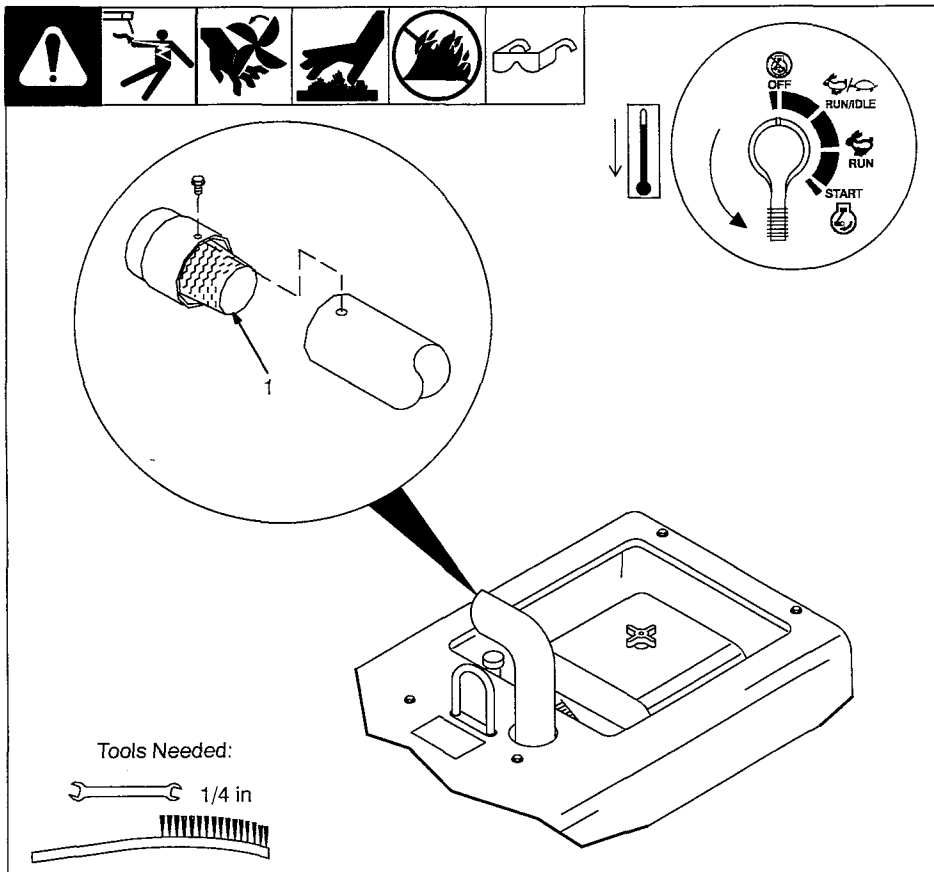
F6 protects the engine wiring harness. If F6 opens, the engine does not crank. If F6 opens while engine is running, weld and auxiliary power output stops.

Replace any open fuses. Reinstall panel before operating unit.

☞ *If a fuse opens, it usually indicates a more serious problem exists. Contact a Factory Authorized Service Agent.*

801 226-B / Ref. 801 221-A / Ref. 183 175-A

8-5. Servicing Optional Spark Arrestor (Kohler-Powered Units)



Tools Needed:

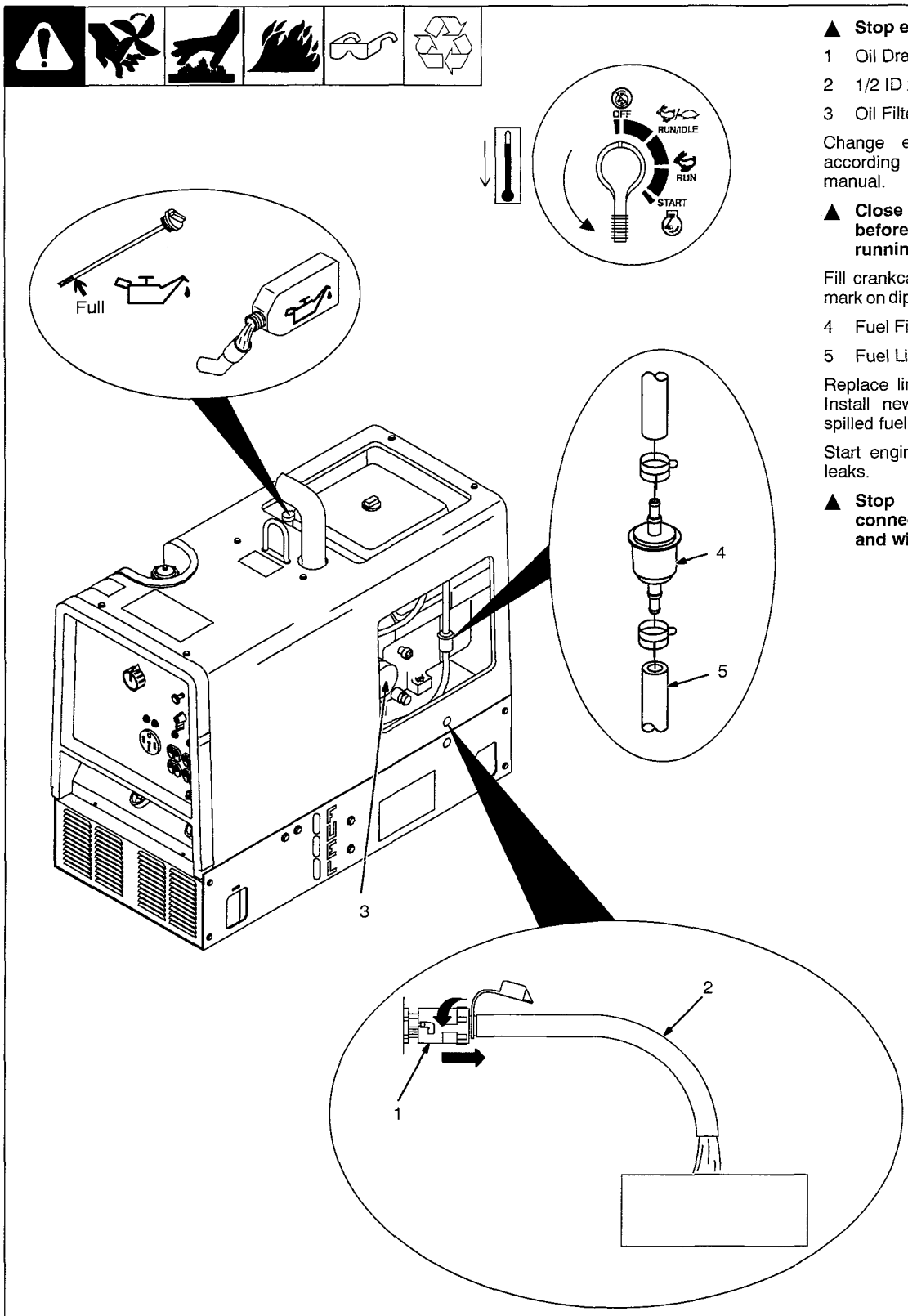
▲ **Stop engine and let cool.**

1 Spark Arrestor Screen

Clean and inspect screen. Replace spark arrestor if screen wires are broken or missing.

Ref. 801 695-A / Ref. 802 339

8-6. Changing Engine Oil, Oil Filter, and Fuel Filter (Kohler-Powered Units)



▲ **Stop engine and let cool.**

1 Oil Drain Valve

2 1/2 ID x 7 in Hose

3 Oil Filter

Change engine oil and filter according to engine owner's manual.

▲ **Close valve and valve cap before adding oil and running engine.**

Fill crankcase with new oil to full mark on dipstick (see Section 8-1).

4 Fuel Filter

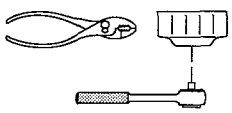
5 Fuel Line

Replace line if cracked or worn. Install new filter. Wipe up any spilled fuel.

Start engine, and check for fuel leaks.

▲ **Stop engine, tighten connections as necessary, and wipe up fuel.**

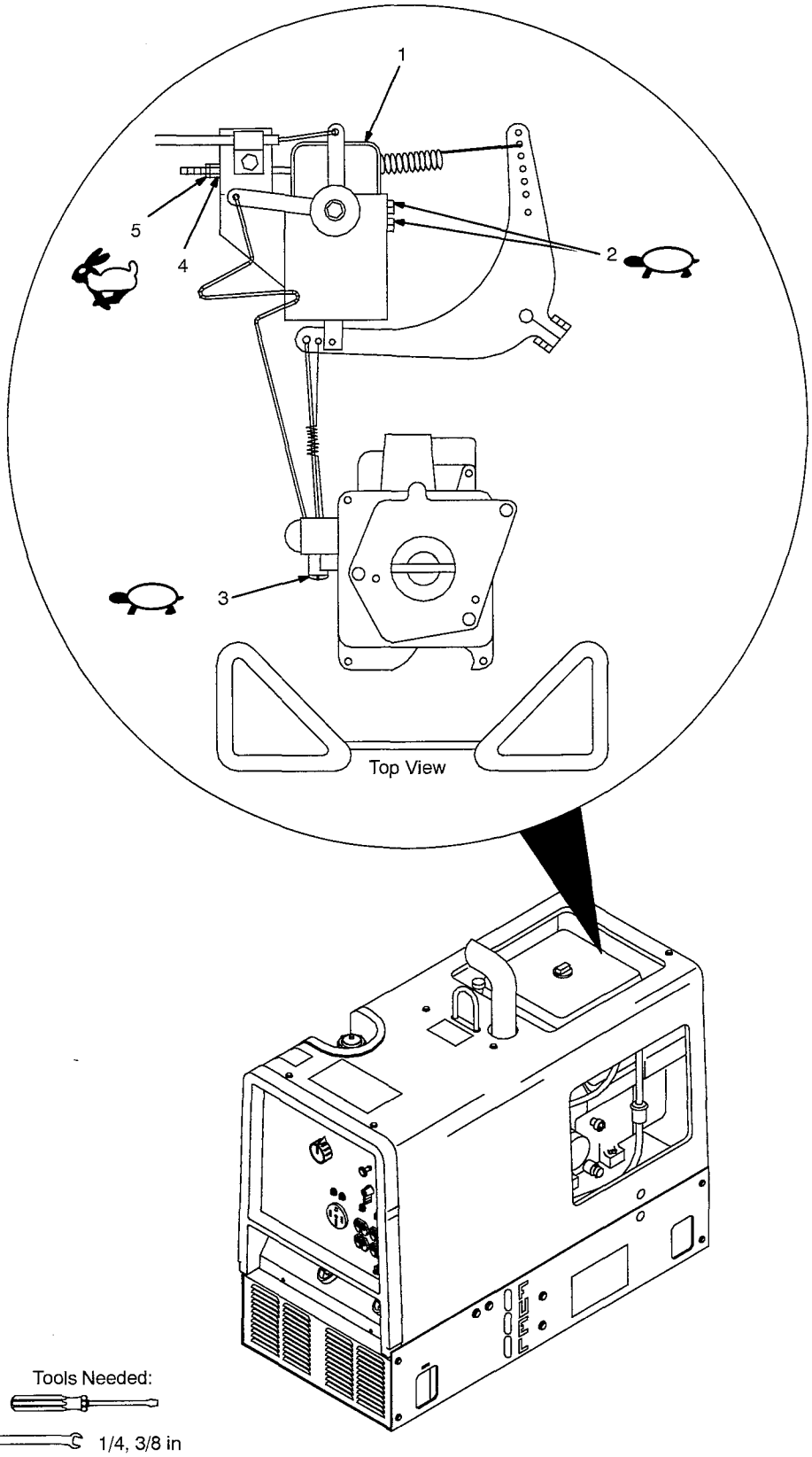
Tools Needed:



802 339 / S-0842

8-7. Adjusting Engine Speed (Kohler-Powered Units)

	2200 ± 50 rpm
	3700 ± 50 rpm



Tools Needed:

1/4, 3/8 in

After tuning engine, check engine speeds with a tachometer (see table). If necessary, adjust speeds as follows:

Start engine and run until warm.

Remove wrapper to access speed adjustments.

Idle Speed Adjustment

Move Engine Control switch to Run/Idle position.

1 Throttle Solenoid

2 Mounting Screws

3 Idle Speed Screw

Loosen mounting screws. Adjust solenoid position so engine runs at idle speed. If necessary, back out idle speed screw so solenoid can be moved to correct position. Tighten mounting screws. Be sure solenoid linkage works smoothly.

Turn idle speed screw for fine adjustments.

Weld/Power Speed Adjustment

Move Engine Control switch to Run position.

4 Weld/Power Speed Adjustment Nut

5 Lock Nut

Loosen lock nut. Turn adjustment nut until engine runs at weld/power speed. Tighten lock nut.

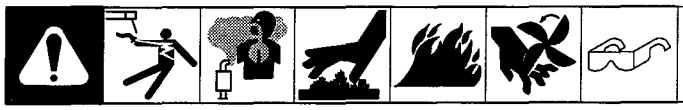
▲ **Stop engine.**

Reinstall wrapper.

802 339 / 801 209-A

SECTION 9 - TROUBLESHOOTING

9-1. Troubleshooting



A. Welding

Trouble	Remedy
No weld output.	Check control settings.
	Check weld connections.
	Check fuse F1 and replace if open (see Section 7-4 or 8-4).
	Unit overloaded. Stop unit and reduce load. Restart unit to reset generator protection circuit and resume operation.
	Be sure all equipment is disconnected from receptacles when starting unit.
	Check plug PLG6 connection.
	Have Factory Authorized Service Agent check brushes, slip rings, integrated rectifier SR2 and field control board PC1.
Low weld output.	Check fuse F1 and replace if open (see Section 7-4 or 8-4).
	Check control settings.
	Check engine speed, and adjust if necessary (see Section 7-7 or 8-7).
	Service air cleaner according to engine manual.
	Have Factory Authorized Service Agent check brushes and slip rings and field control board PC1.
High weld output.	Check control settings.
	Check engine speed, and adjust if necessary (see Section 7-7 or 8-7).
Erratic weld output.	Check control settings.
	Tighten and clean connections to electrode and workpiece.
	Use dry, properly-stored electrodes for Stick and TIG welding.
	Remove excessive coils from weld cables.
	Clean and tighten connections both inside and outside welding generator.
	Check engine speed, and adjust if necessary (see Section 7-7 or 8-7).
	Have Factory Authorized Service Agent check brushes and slip rings.

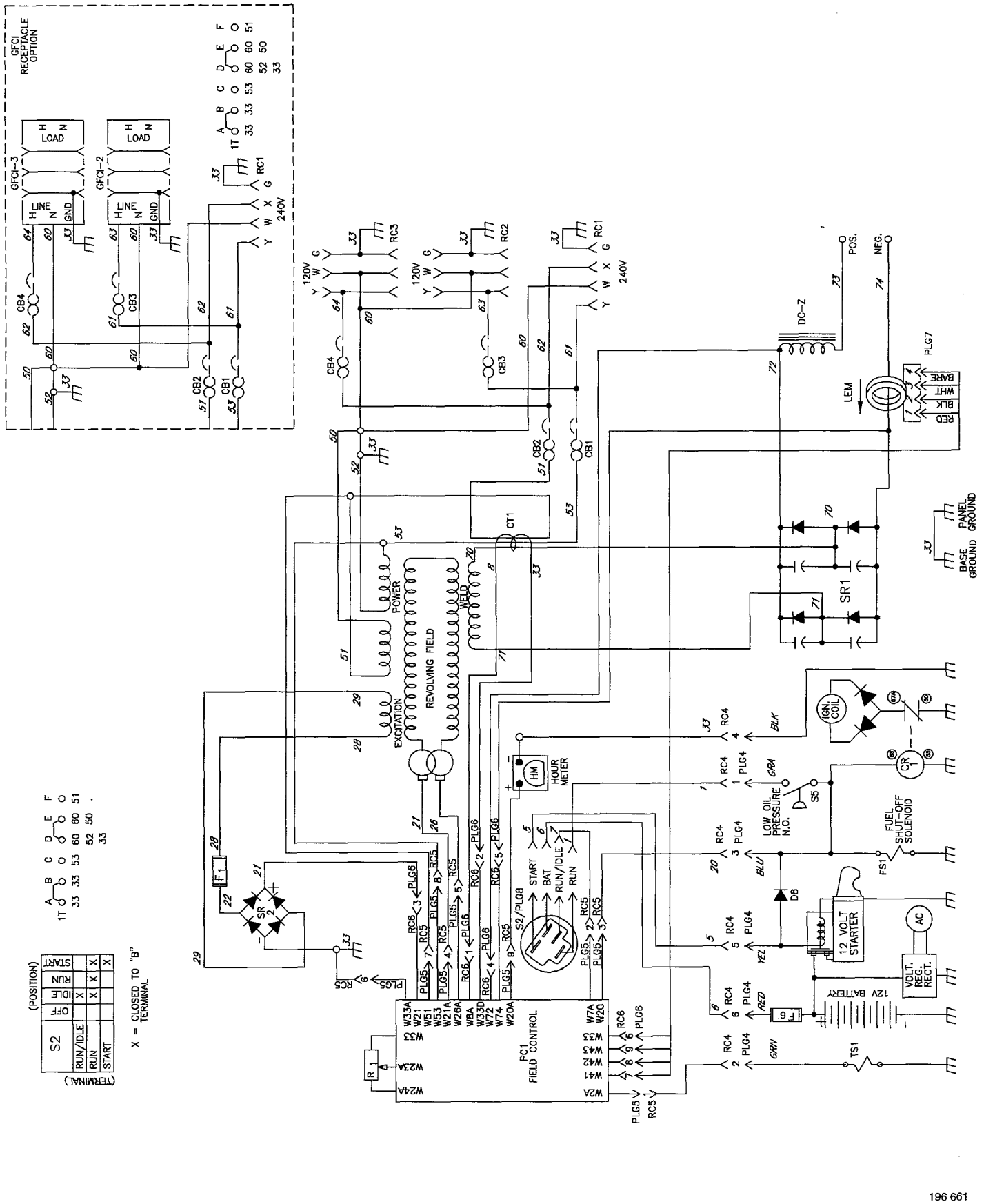
B. Auxiliary Power

Trouble	Remedy
No output at auxiliary power receptacles.	Reset circuit breakers (see Section 6-1 or 6-2).
	Press optional GFCI receptacle Reset button (see Section 6-2).
	Check fuse F1 and replace if open (see Section 7-4 or 8-4).
	Unit overloaded. Stop unit and reduce load. Restart unit to reset generator protection circuit and resume operation.
	Check plug PLG6 connection.
	Have Factory Authorized Service Agent check brushes, slip rings, integrated rectifier SR2 and field control board PC1.
High power output.	Check engine speed, and adjust if necessary (see Section 7-7 or 8-7).
Low power output.	Check fuse F1 and replace if open (see Section 7-4 or 8-4).
	Check engine speed, and adjust if necessary (see Section 7-7 or 8-7).

Trouble	Remedy
Erratic power output.	Check fuel level.
	Check engine speed and adjust if necessary (see Section 7-7 or 8-7).
	Check receptacle wiring and connections.
	Have Factory Authorized Service Agent check brushes and slip rings.

C. Engine

Trouble	Remedy
Engine will not crank.	Check fuse F6, and replace if open (see Section 7-4 or 8-4).
	Check battery voltage.
	Check battery connections and tighten if necessary.
	Check plug PLG4 and plug PLG8 connections.
	Have Factory Authorized Service Agent check Engine Control switch S2.
Engine will not start.	Check fuel level.
	Check battery voltage.
	Check battery connections and tighten if necessary.
	Check oil level (see Section 4-2 or 4-3).
	Check low oil pressure shutdown switch (see Parts List for location).
	Have Factory Authorized Service Agent check fuel shutoff solenoid FS1.
Engine starts, but stops when Engine Control switch returns to Run position.	Check oil level.
	Check and refill crankcase with proper viscosity oil for operating temperature, if necessary.
	Check low oil pressure shutdown switch (see Parts List for location).
Engine stopped during normal operation.	Check fuel level.
	Check oil level (see Section 4-2 or 4-3).
	Check low oil pressure shutdown switch (see Parts List for location)
	Periodically recharge battery (approximately every 3 months).
	Replace battery.
	Check voltage regulator and connections according to engine manual.
	Have Factory Authorized Service Agent check fuel shutoff solenoid FS1.
Battery Discharges between uses.	Clean battery, terminals, and posts with baking soda and water solution; rinse with clear water.
	Periodically recharge battery (approximately every 3 months).
	Replace battery.
	Check voltage regulator and connections according to engine manual.
Engine idles, but does not come up to weld speed.	Have Factory Authorized Service Agent check field control board PC1, and current transformer CT1.
Engine speed varies rapidly under heavy auxiliary power load.	Reduce auxiliary power load.
Unstable or sluggish engine speeds.	Readjust throttle linkage if necessary. Check throttle solenoid TS1 for smooth operation.
	Tune-up engine according to engine manual.
Engine does not return to idle speed.	Remove weld and auxiliary power loads.
	Check throttle linkage for smooth, non-binding operation.
	Have Factory Authorized Service Agent check current transformer CT1, Engine Control switch S2, throttle solenoid TS1, and field control board PC1.



196 661

Figure 10-1. Circuit Diagram For Welding Generator (Onan-Powered Units)

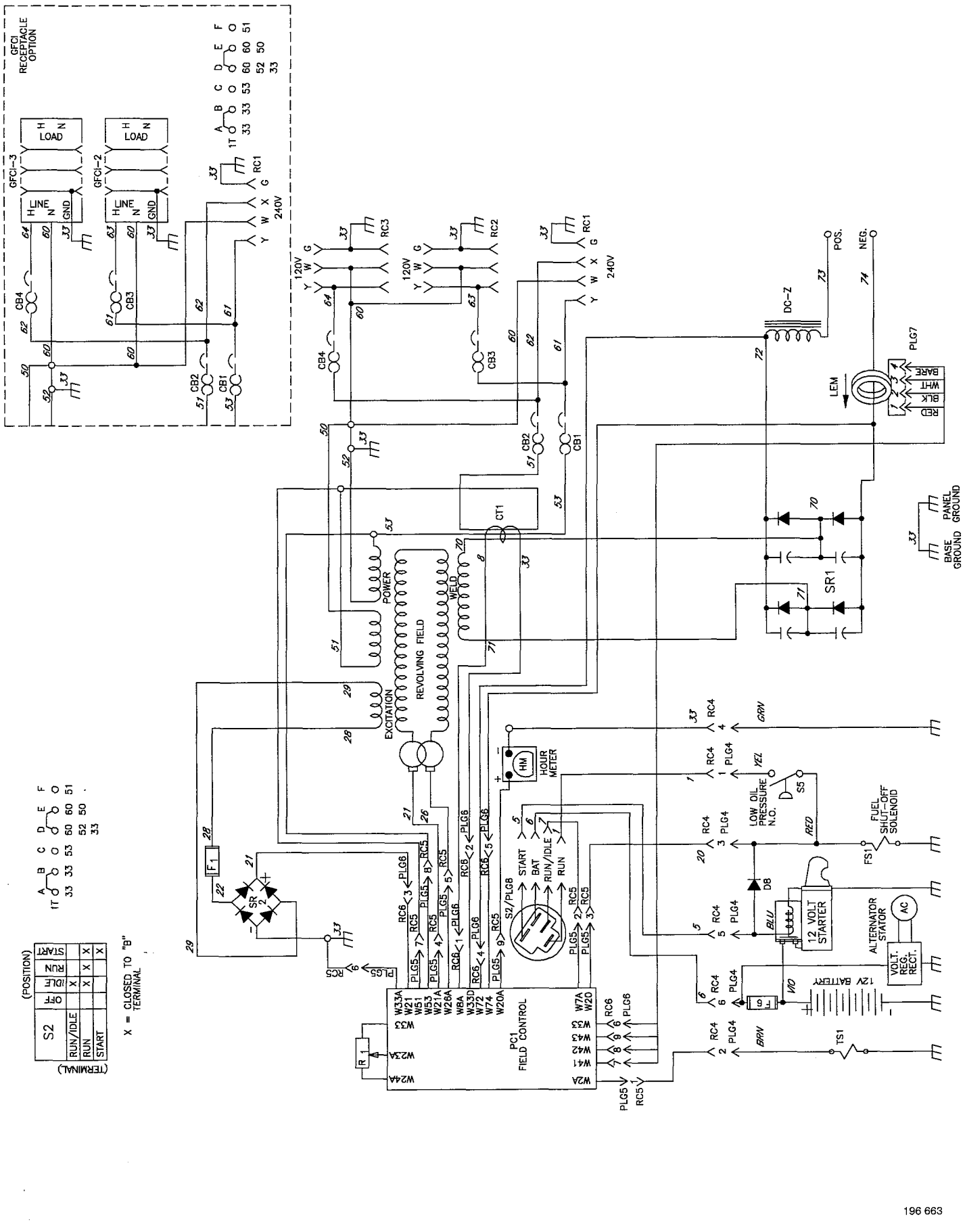


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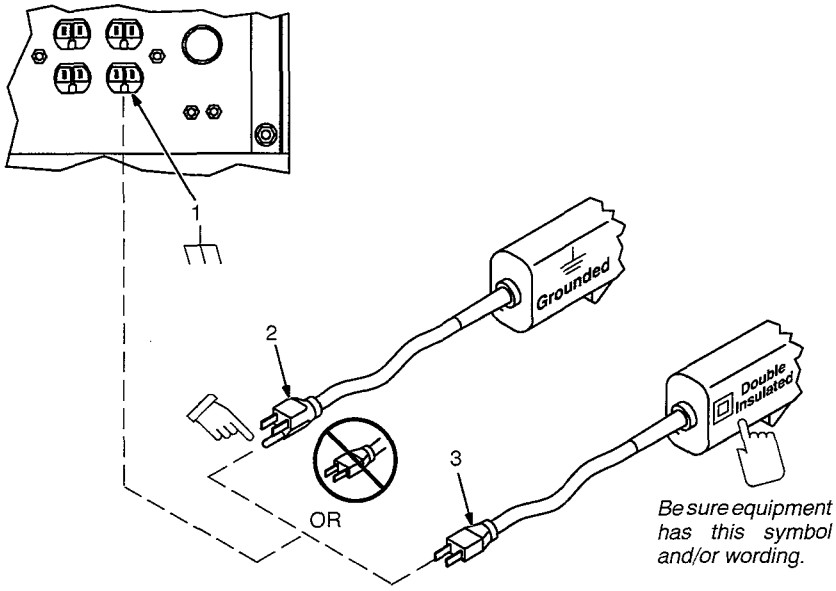
Figure 10-2. Circuit Diagram For Welding Generator (Kohler-Powered Units)

SECTION 11 - AUXILIARY POWER GUIDELINES

11-1. Selecting Equipment

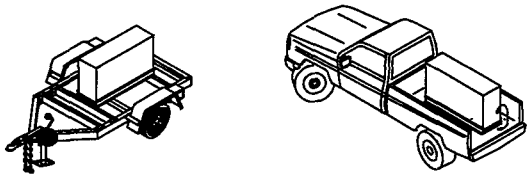


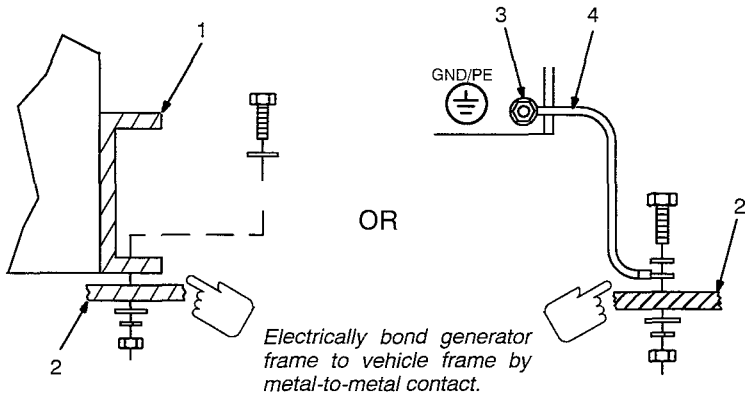
1 Auxiliary Power Receptacles - Neutral Bonded To Frame
2 3-Prong Plug From Case Grounded Equipment
3 2-Prong Plug From Double Insulated Equipment

Be sure equipment has this symbol and/or wording.

aux_pwr 2/99 - Ref. ST-159 730 / ST-800 577

11-2. Grounding Generator To Truck Or Trailer Frame





Electrically bond generator frame to vehicle frame by metal-to-metal contact.

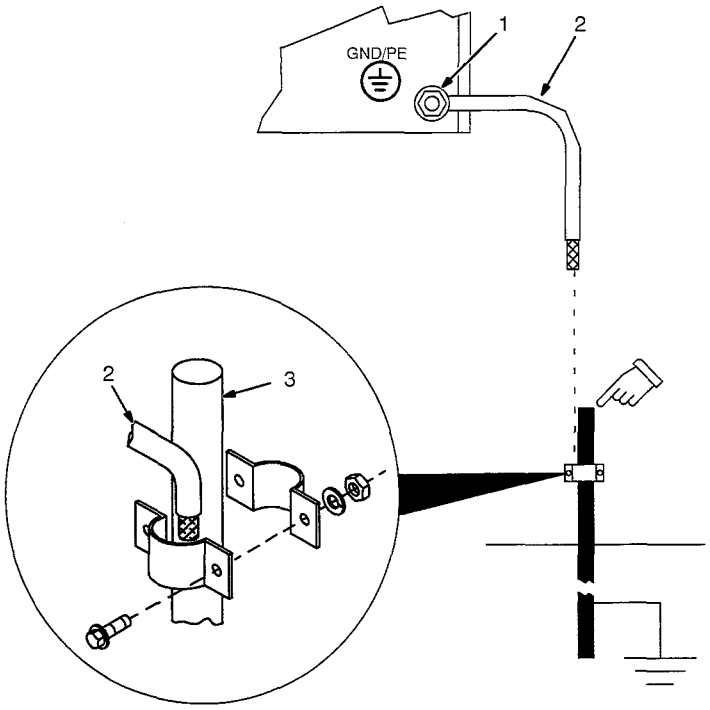
1 Generator Base
2 Metal Vehicle Frame
3 Equipment Grounding Terminal
4 Grounding Cable

Use #10 AWG or larger insulated copper wire.

▲ **If unit does not have GFCI receptacles, use GFCI-protected extension cord.**

S-0854

11-3. Grounding When Supplying Building Systems



1 Equipment Grounding Terminal

2 Grounding Cable

Use #10 AWG or larger insulated copper wire.

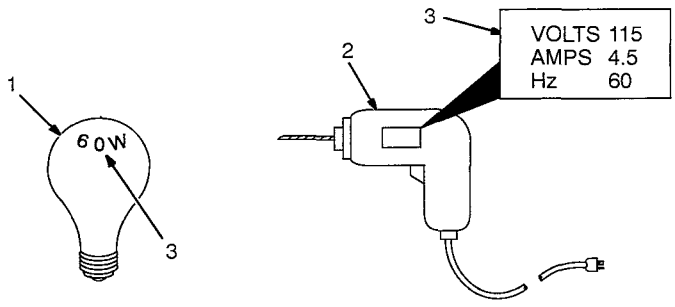
3 Ground Device

▲ **Ground generator to system earth ground if supplying power to a premises (home, shop, farm) wiring system.**

Use ground device as stated in electrical codes.

ST-800 576-B

11-4. How Much Power Does Equipment Require?



1 Resistive Load

A light bulb is a resistive load and *requires a constant amount of* power.

2 Non-Resistive Load

Equipment with a motor is a non-resistive load and requires approximately six times more power while starting the motor than when running (see Section 11-8).

3 Rating Data

Rating shows volts and amperes, or watts required to run equipment.

AMPERES x VOLTS = WATTS

EXAMPLE 1: If a drill uses 4.5 amperes at 115 volts, calculate its running power requirement in watts.

4.5 A x 115 V = 520 W

The load applied by the drill is 520 watts.

EXAMPLE 2: If three 200 watt flood lamps are used with the drill from Example 1, add the individual loads to calculate total load.

(200 W + 200 W + 200 W) + 520 W = 1120 W

The total load applied by the three flood lamps and drill is 1120 watts.

S-0623

11-5. Approximate Power Requirements For Industrial Motors

Industrial Motors	Rating	Starting Watts	Running Watts
Split Phase	1/8 HP	800	300
	1/6 HP	1225	500
	1/4 HP	1600	600
	1/3 HP	2100	700
	1/2 HP	3175	875
Capacitor Start-Induction Run	1/3 HP	2020	720
	1/2 HP	3075	975
	3/4 HP	4500	1400
	1 HP	6100	1600
	1-1/2 HP	8200	2200
	2 HP	10550	2850
	3 HP	15900	3900
	5 HP	23300	6800
Capacitor Start-Capacitor Run	1-1/2 HP	8100	2000
	5 HP	23300	6000
	7-1/2 HP	35000	8000
	10 HP	46700	10700
Fan Duty	1/8 HP	1000	400
	1/6 HP	1400	550
	1/4 HP	1850	650
	1/3 HP	2400	800
	1/2 HP	3500	1100

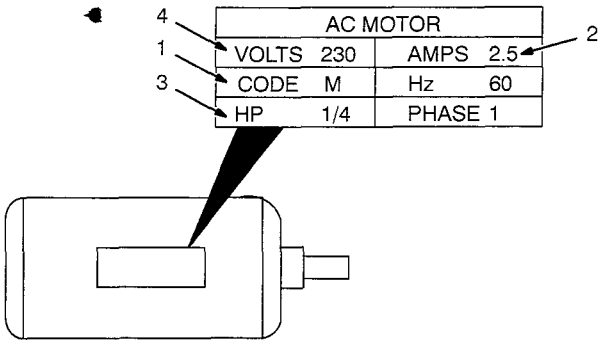
11-6. Approximate Power Requirements For Farm/Home Equipment

Farm/Home Equipment	Rating	Starting Watts	Running Watts
Stock Tank De-Icer		1000	1000
Grain Cleaner	1/4 HP	1650	650
Portable Conveyor	1/2 HP	3400	1000
Grain Elevator	3/4 HP	4400	1400
Milk Cooler		2900	1100
Milker (Vacuum Pump)	2 HP	10500	2800
FARM DUTY MOTORS	1/3 HP	1720	720
Std. (e.g. Conveyors,	1/2 HP	2575	975
Feed Augers, Air	3/4 HP	4500	1400
Compressors)	1 HP	6100	1600
	1-1/2 HP	8200	2200
	2 HP	10550	2850
	3 HP	15900	3900
	5 HP	23300	6800
High Torque (e.g. Barn	1-1/2 HP	8100	2000
Cleaners, Silo Unloaders,	5 HP	23300	6000
Silo Hoists, Bunk Feeders)	7-1/2 HP	35000	8000
	10 HP	46700	10700
3-1/2 cu. ft. Mixer	1/2 HP	3300	1000
High Pressure 1.8 Gal/Min	500 PSI	3150	950
Washer 2 gal/min	550 PSI	4500	1400
2 gal/min	700 PSI	6100	1600
Refrigerator or Freezer		3100	800
Shallow Well Pump	1/3 HP	2150	750
	1/2 HP	3100	1000
Sump Pump	1/3 HP	2100	800
	1/2 HP	3200	1050

11-7. Approximate Power Requirements For Contractor Equipment

Contractor	Rating	Starting Watts	Running Watts
Hand Drill	1/4 in	350	350
	3/8 in	400	400
	1/2 in	600	600
Circular Saw	6-1/2 in	500	500
	7-1/4 in	900	900
	8-1/4 in	1400	1400
Table Saw	9 in	4500	1500
	10 in	6300	1800
Band Saw	14 in	2500	1100
Bench Grinder	6 in	1720	720
	8 in	3900	1400
	10 in	5200	1600
Air Compressor	1/2 HP	3000	1000
	1 HP	6000	1500
	1-1/2 HP	8200	2200
	2 HP	10500	2800
Electric Chain Saw	1-1/2 HP, 12 in	1100	1100
	2 HP, 14 in	1100	1100
Electric Trimmer	Standard 9 in	350	350
	Heavy Duty 12 in	500	500
Electric Cultivator	1/3 HP	2100	700
Elec. Hedge Trimmer	18 in	400	400
Flood Lights	HID	125	100
	Metal Halide	313	250
	Mercury	1000	
	Sodium	1400	
	Vapor	1250	1000
Submersible Pump	400 gph	600	200
Centrifugal Pump	900 gph	900	500
Floor Polisher	3/4 HP, 16 in	4500	1400
	1 HP, 20 in	6100	1600
High Pressure Washer	1/2 HP	3150	950
	3/4 HP	4500	1400
	1 HP	6100	1600
55 gal Drum Mixer	1/4 HP	1900	700
Wet & Dry Vac	1.7 HP	900	900
	2-1/2 HP	1300	1300

11-8. Power Required To Start Motor



1 Motor Start Code
2 Running Amperage
3 Motor HP
4 Motor Voltage

To find starting amperage:

Step 1: Find code and use table to find kVA/HP. If code is not listed, multiply running amperage by six to find starting amperage.

Step 2: Find Motor HP and Volts.

Step 3: Determine starting amperage (see example).

Welding generator amperage output must be at least twice the motor's running amperage.

Single-Phase Induction Motor Starting Requirements

Motor Start Code	G	H	J	K	L	M	N	P
KVA/HP	6.3	7.1	8.0	9.0	10.0	11.2	12.5	14.0

$$\frac{\text{kVA/HP x HP x 1000}}{\text{VOLTS}} = \text{STARTING AMPERAGE}$$

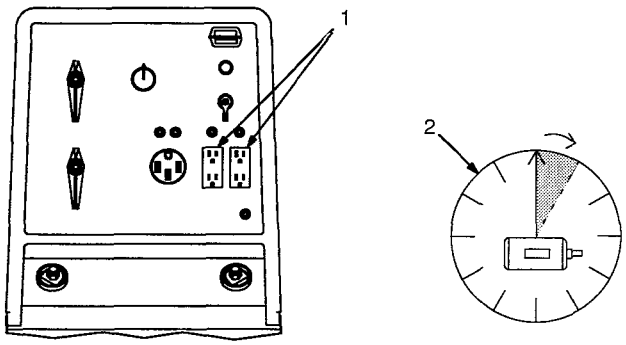
EXAMPLE: Calculate the starting amperage required for a 230 V, 1/4 HP motor with a motor start code of M.

Volts = 230 HP = 1/4 Using Table, Code M results in kVA/HP = 11.2

$$\frac{11.2 \times 1/4 \times 1000}{230} = 12.2 \text{ A}$$ **Starting the motor requires 12.2 amperes.**

S-0624

11-9. How Much Power Can Generator Supply?



1 Limit Load To 90% Of Generator Output

Always start non-resistive (motor) loads in order from largest to smallest, and add resistive loads last.

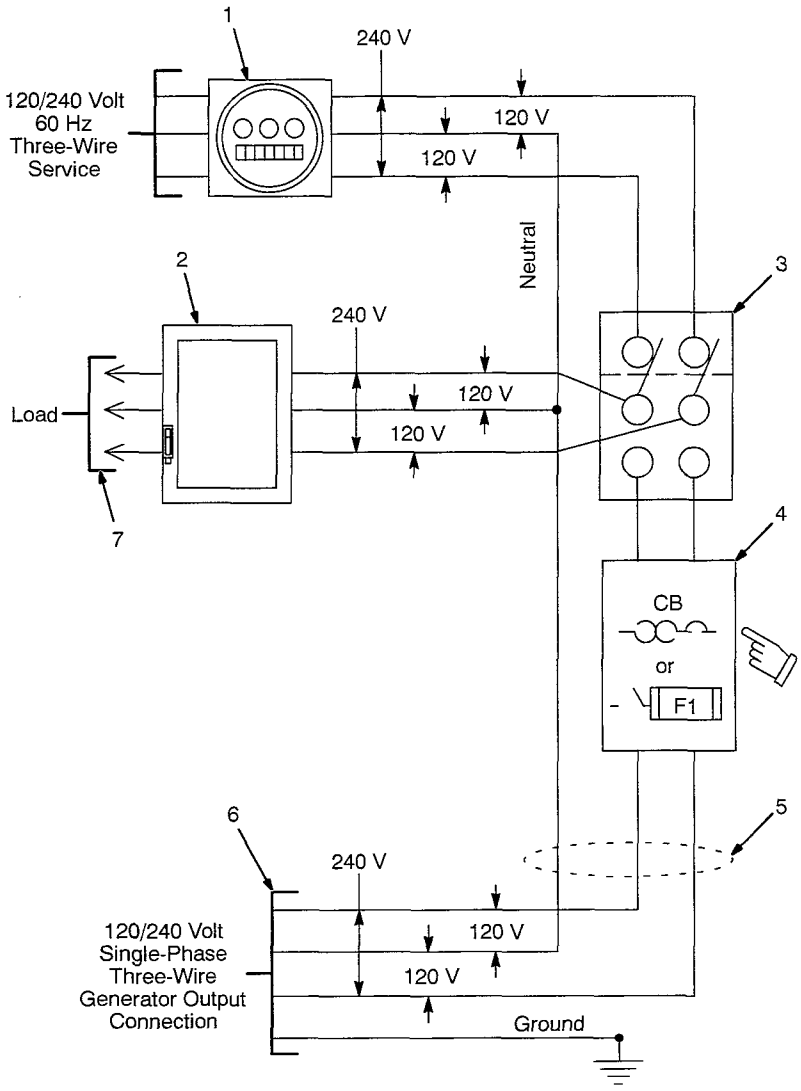
2 5 Second Rule

If motor does not start within 5 seconds, turn off power to prevent motor damage. Motor requires more power than generator can supply.

Ref. ST-800 396-A / S-0625

11-10. Typical Connections To Supply Standby Power

☞ *Customer-supplied equipment is required if generator is to supply standby power during emergencies or power outages.*



Item 4 is not necessary if circuit protection is already present in welding generator auxiliary power output circuit.

1 Power Company Service Meter

2 Main and Branch Overcurrent Protection

3 Double-Pole, Double-Throw Transfer Switch

Obtain and install correct switch. Switch rating must be same as or greater than the branch overcurrent protection.

4 Circuit Breakers or Fused Disconnect Switch

Obtain and install correct circuit breakers or switch.

5 *Extension Cord*

Select as shown in Section 11-11.

6 Generator Connections

Connect terminals or plug of adequate amperage capacity to cord. Follow all applicable codes and safety practices.

Turn off or unplug all equipment connected to generator before starting or stopping engine. When starting or stopping, the engine has low speed which causes low voltage and frequency.

7 Load Connections

S-0405-A

11-11. Selecting Extension Cord (Use Shortest Cord Possible)

Cord Lengths for 120 Volt Loads

▲ **If unit does not have GFCI receptacles, use GFCI-protected extension cord.**

Current (Amperes)	Load (Watts)	Maximum Allowable Cord Length in ft (m) for Conductor Size (AWG)*					
		4	6	8	10	12	14
5	600			350 (106)	225 (68)	137 (42)	100 (30)
7	840		400 (122)	250 (76)	150 (46)	100 (30)	62 (19)
10	1200	400 (122)	275 (84)	175 (53)	112 (34)	62 (19)	50 (15)
15	1800	300 (91)	175 (53)	112 (34)	75 (23)	37 (11)	30 (9)
20	2400	225 (68)	137 (42)	87 (26)	50 (15)	30 (9)	
25	3000	175 (53)	112 (34)	62 (19)	37 (11)		
30	3600	150 (46)	87 (26)	50 (15)	37 (11)		
35	4200	125 (38)	75 (23)	50 (15)			
40	4800	112 (34)	62 (19)	37 (11)			
45	5400	100 (30)	62 (19)				
50	6000	87 (26)	50 (15)				

*Conductor size is based on maximum 2% voltage drop

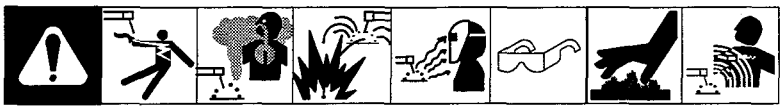
Cord Lengths for 240 Volt Loads

▲ **If unit does not have GFCI receptacles, use GFCI-protected extension cord.**

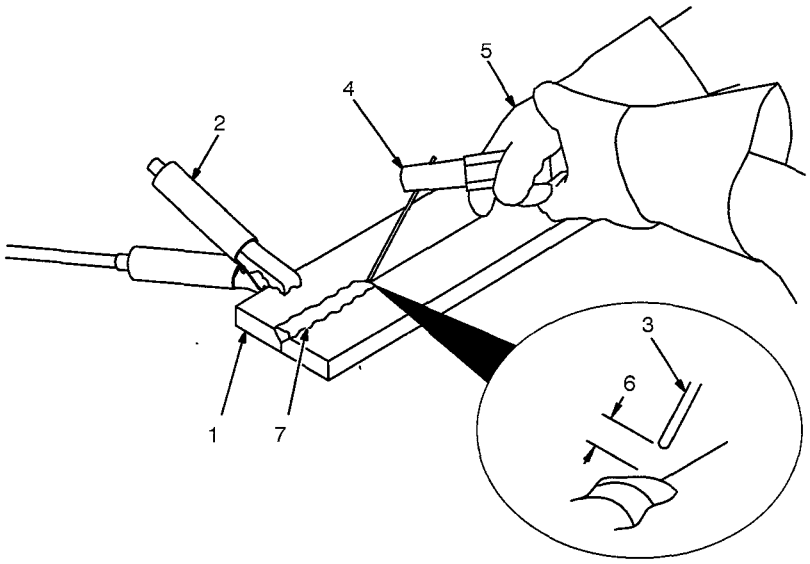
Current (Amperes)	Load (Watts)	Maximum Allowable Cord Length in ft (m) for Conductor Size (AWG)*					
		4	6	8	10	12	14
5	1200			700 (213)	450 (137)	225 (84)	200 (61)
7	1680		800 (244)	500 (152)	300 (91)	200 (61)	125 (38)
10	2400	800 (244)	550 (168)	350 (107)	225 (69)	125 (38)	100 (31)
15	3600	600 (183)	350 (107)	225 (69)	150 (46)	75 (23)	60 (18)
20	4800	450 (137)	275 (84)	175 (53)	100 (31)	60 (18)	
25	6000	350 (107)	225 (69)	125 (38)	75 (23)		
30	7000	300 (91)	175 (53)	100 (31)	75 (23)		
35	8400	250 (76)	150 (46)	100 (31)			
40	9600	225 (69)	125 (38)	75 (23)			
45	10,800	200 (61)	125 (38)				
50	12,000	175 (53)	100 (31)				

*Conductor size is based on maximum 2% voltage drop

SECTION 12 - STICK WELDING (SMAW) GUIDELINES



12-1. Stick Welding Procedure



▲ **Weld current starts when electrode touches workpiece.**

▲ **Weld current can damage electronic parts in vehicles. Disconnect both battery cables before welding on a vehicle. Place work clamp as close to the weld as possible.**

1 Workpiece

Make sure workpiece is clean before welding.

2 Work Clamp

3 Electrode

A small diameter electrode requires less current than a large one. Follow electrode manufacturer's instructions when setting weld amperage (see Section 12-2).

4 Insulated Electrode Holder

5 Electrode Holder Position

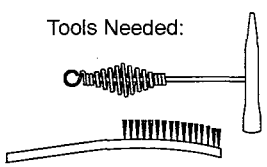
6 Arc Length

Arc length is the distance from the electrode to the workpiece. A short arc with correct amperage will give a sharp, crackling sound.

7 Slag

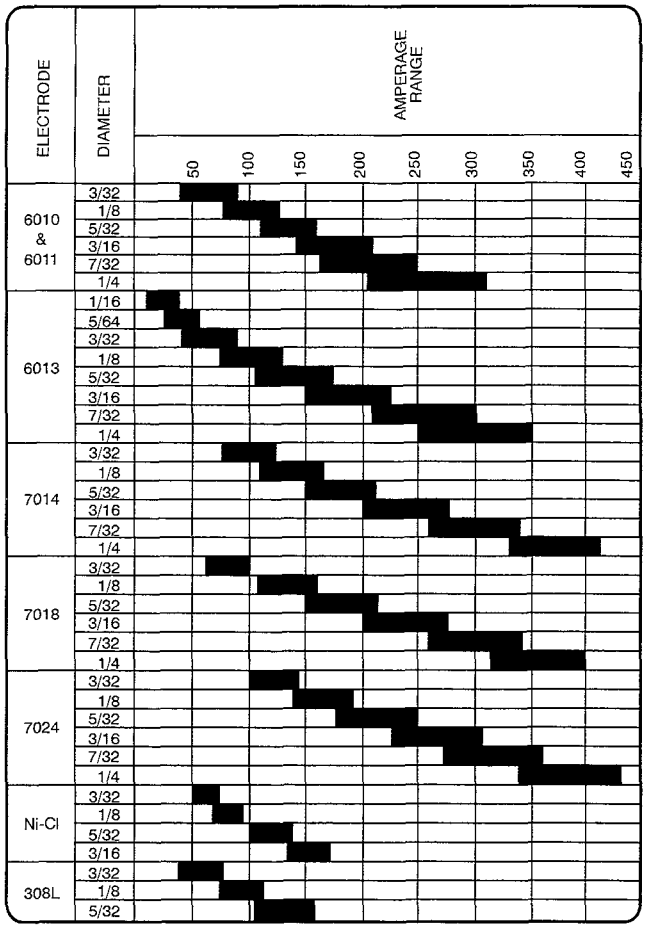
Use a chipping hammer and wire brush to remove slag. Remove slag and check weld bead before making another weld pass.

Tools Needed:



stick 12/96 - ST-151 593

12-2. Electrode and Amperage Selection Chart

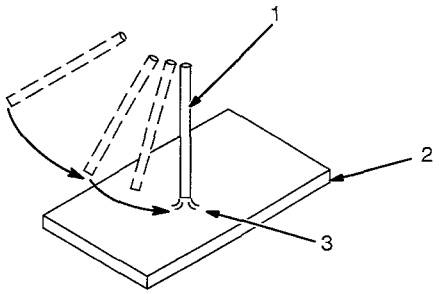


ELECTRODE	DC*	AC	POSITION	PENETRATION	USAGE
6010	EP		ALL	DEEP	MIN. PREP, ROUGH HIGH SPATTER
6011	EP	✓	ALL	DEEP	
6013	EP,EN	✓	ALL	LOW	GENERAL
7014	EP,EN	✓	ALL	MED	SMOOTH, EASY, FAST
7018	EP	✓	ALL	LOW	LOW HYDROGEN, STRONG
7024	EP,EN	✓	FLAT HORIZ FILLET	LOW	SMOOTH, EASY, FASTER
NI-CL	EP	✓	ALL	LOW	CAST IRON
308L	EP	✓	ALL	LOW	STAINLESS

*EP = ELECTRODE POSITIVE (REVERSE POLARITY)
EN = ELECTRODE NEGATIVE (STRAIGHT POLARITY)

Ref. S-087 985-A

12-3. Striking an Arc - Scratch Start Technique

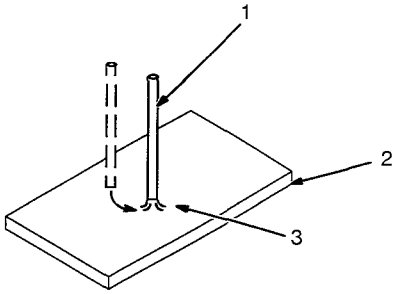


1 Electrode
2 Workpiece
3 Arc

Drag electrode across workpiece like striking a match; lift electrode slightly after touching work. If arc goes out electrode was lifted to high. If electrode sticks to workpiece, use a quick twist to free it.

S-0049

12-4. Striking an Arc - Tapping Technique

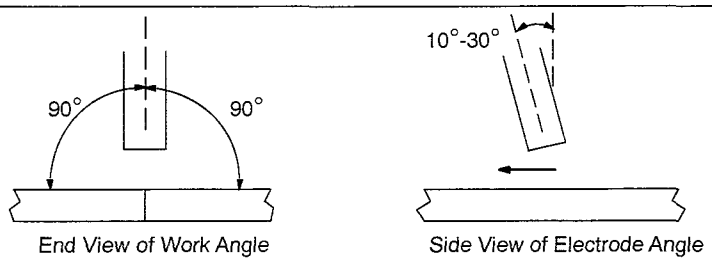


1 Electrode
2 Workpiece
3 Arc

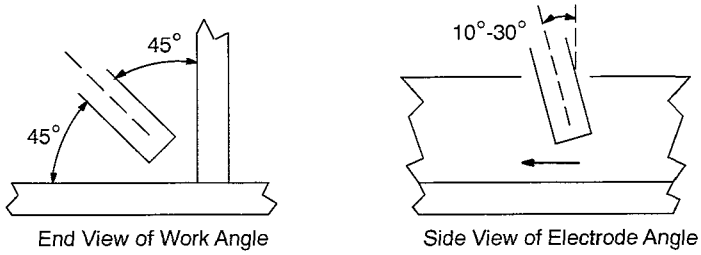
Bring electrode straight down to workpiece; then lift slightly to start arc. If arc goes out, electrode was lifted too high. If electrode sticks to workpiece, use a quick twist to free it.

S-0050

12-5. Positioning Electrode Holder



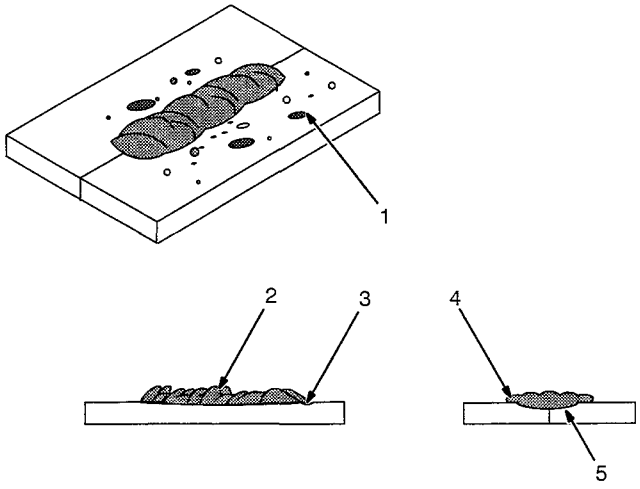
GROOVE WELDS



FILLET WELDS

S-0060

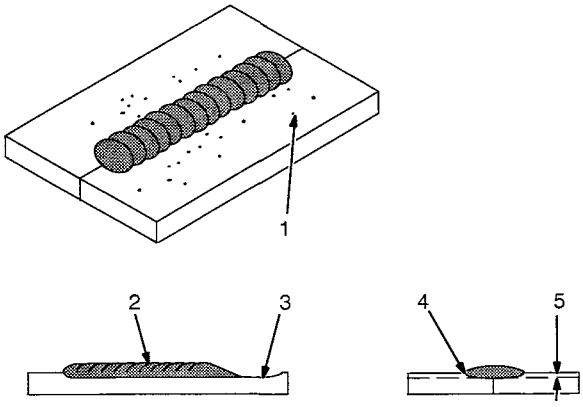
12-6. Poor Weld Bead Characteristics



1 Large Spatter Deposits
2 Rough, Uneven Bead
3 Slight Crater During Welding
4 Bad Overlap
5 Poor Penetration

S-0053-A

12-7. Good Weld Bead Characteristics



1 Fine Spatter
2 Uniform Bead
3 Moderate Crater During Welding

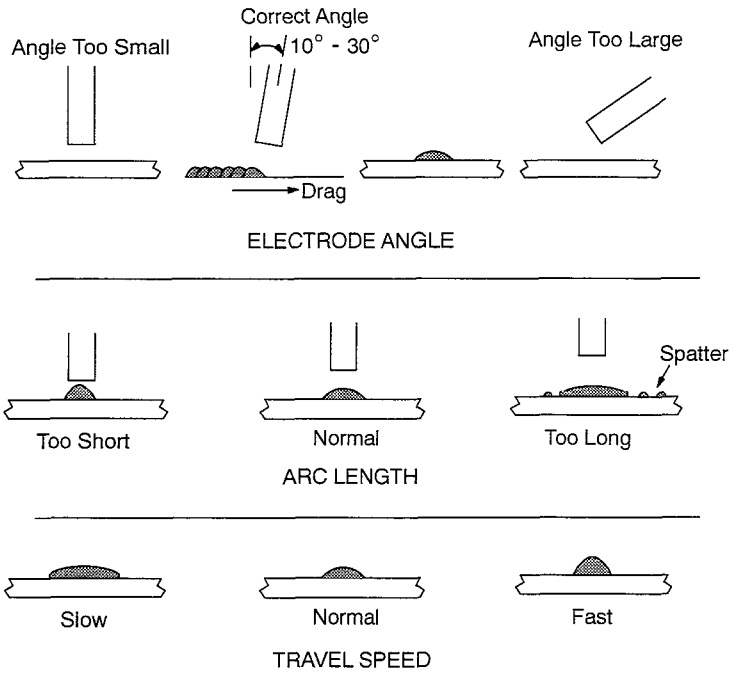
Weld a new bead or layer for each 1/8 in. (3.2 mm) thickness in metals being welded.

4 No Overlap
5 Good Penetration into Base Metal

S-0052-B

12-8. Conditions That Affect Weld Bead Shape

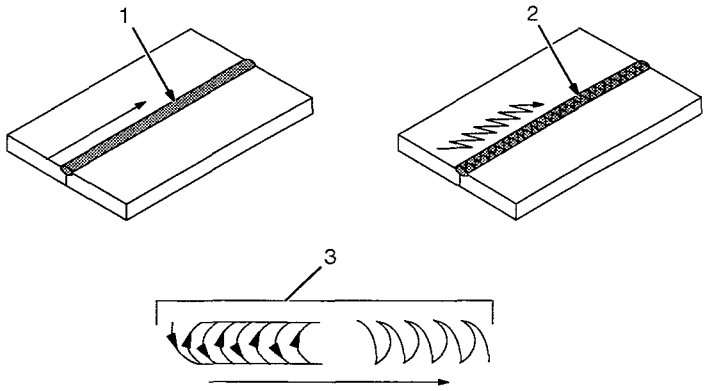
NOTE ☞ *Weld bead shape is affected by electrode angle, arc length, travel speed, and thickness of base metal.*



S-0061

12-9. Electrode Movement During Welding

NOTE ☞ *Normally, a single stringer bead is satisfactory for most narrow groove weld joints; however, for wide groove weld joints or bridging across gaps, a weave bead or multiple stringer beads work better.*



1 Stringer Bead - Steady Movement Along Seam

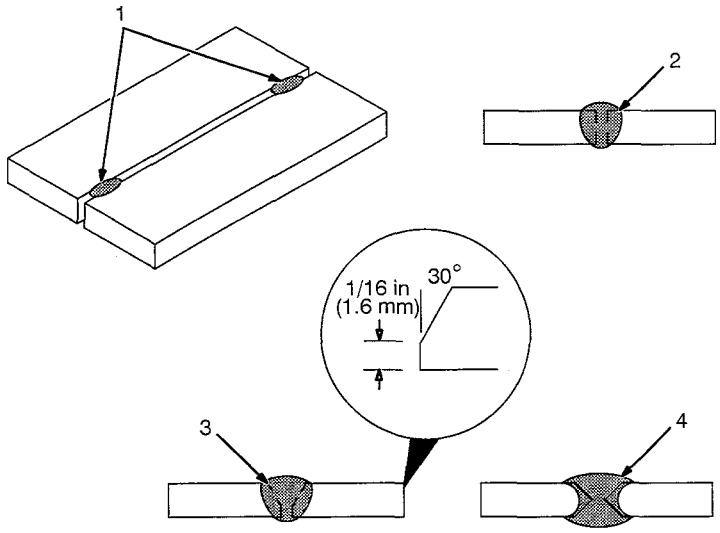
2 Weave Bead - Side to Side Movement Along Seam

3 Weave Patterns

Use weave patterns to cover a wide area in one pass of the electrode. Do not let weave width exceed 2-1/2 times diameter of electrode.

S-0054-A

12-10. Butt Joints



1 Tack Welds

Prevent edges of joint from drawing together ahead of electrode by tack welding the materials in position before final weld.

2 Square Groove Weld

Good for materials up to 3/16 in (5 mm) thick.

3 Single V-Groove Weld

Good for materials 3/16 - 3/4 in (5-19 mm) thick. Cut bevel with oxyacetylene or plasma cutting equipment. Remove scale from material after cutting. A grinder can also be used to prepare bevels.

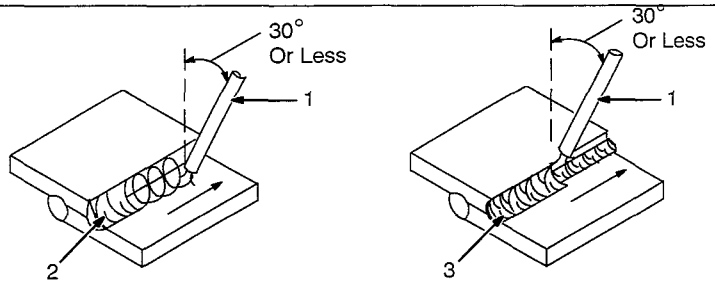
Create 30 degree angle of bevel on materials in V-groove welding.

4 Double V-Groove Weld

Good for materials thicker than 3/16 in (5 mm).

S-0662

12-11. Lap Joint



1 Electrode

2 Single-Layer Fillet Weld

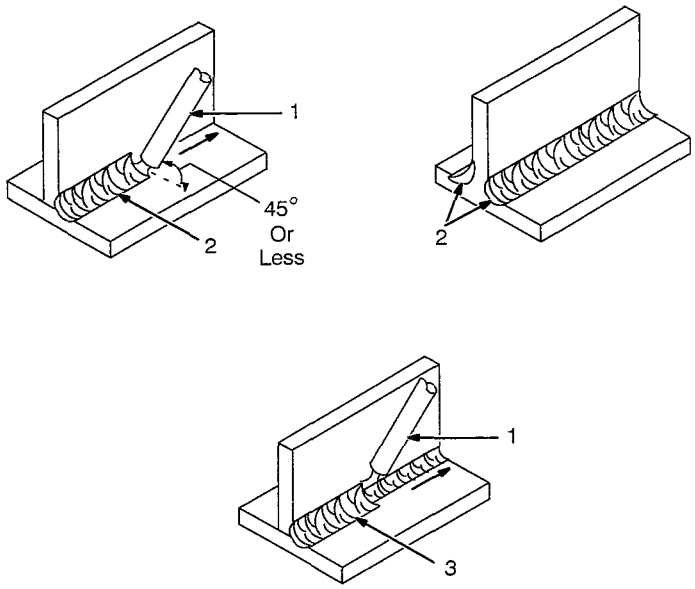
Move electrode in circular motion.

3 Multi-Layer Fillet Weld

Weld a second layer when a heavier fillet is needed. Remove slag before making another weld pass. Weld both sides of joint for maximum strength.

S-0063 / S-0064

12-12. Tee Joint



1 Electrode

2 Fillet Weld

Keep arc short and move at definite rate of speed. Hold electrode as shown to provide fusion into the corner. Square edge of the weld surface.

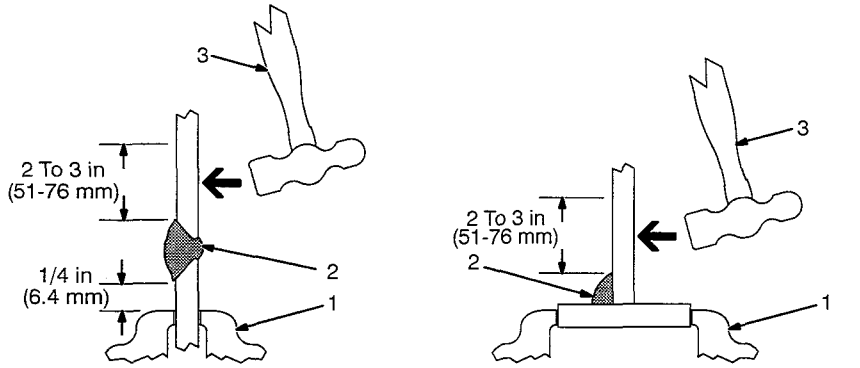
For maximum strength weld both sides of upright section.

3 Multi-Layer Deposits

Weld a second layer when a heavier fillet is needed. Use any of the weaving patterns shown in Section 12-9. Remove slag before making another weld pass.

S-0060 / S-0058-A / S-0061

12-13. Weld Test

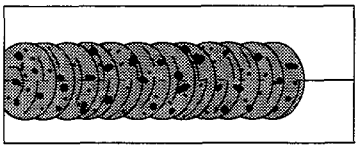


1 Vise
2 Weld Joint
3 Hammer

Strike weld joint in direction shown. A good weld bends over but does not break.

S-0057-B

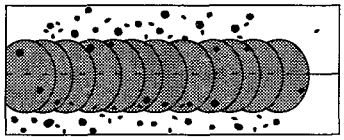
12-14. Troubleshooting - Porosity



Porosity - small cavities or holes resulting from gas pockets in weld metal.

Possible Causes	Corrective Actions
Arc length too long.	Reduce arc length.
Damp electrode.	Use dry electrode.
Workpiece dirty.	Remove all grease, oil, moisture, rust, paint, coatings, slag, and dirt from work surface before welding.

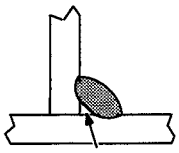
12-15. Troubleshooting - Excessive Spatter

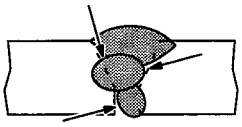


Excessive Spatter - scattering of molten metal particles that cool to solid form near weld bead.

Possible Causes	Corrective Actions
Amperage too high for electrode.	Decrease amperage or select larger electrode.
Arc length too long or voltage too high.	Reduce arc length or voltage.

12-16. Troubleshooting - Incomplete Fusion

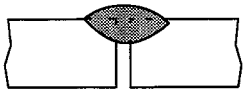




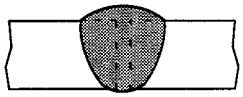
Incomplete Fusion - failure of weld metal to fuse completely with base metal or a preceeding weld bead.

Possible Causes	Corrective Actions
Insufficient heat input.	Increase amperage. Select larger electrode and increase amperage.
Improper welding technique.	Place stringer bead in proper location(s) at joint during welding.
	Adjust work angle or widen groove to access bottom during welding.
	Momentarily hold arc on groove side walls when using weaving technique.
	Keep arc on leading edge of weld puddle.
Workpiece dirty.	Remove all grease, oil, moisture, rust, paint, coatings, slag, and dirt from work surface before welding.

12-17. Troubleshooting - Lack Of Penetration



Lack of Penetration

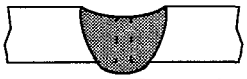


Good Penetration

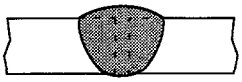
Lack Of Penetration - shallow fusion between weld metal and base metal.

Possible Causes	Corrective Actions
Improper joint preparation.	Material too thick. Joint preparation and design must provide access to bottom of groove.
Improper weld technique.	Keep arc on leading edge of weld puddle.
Insufficient heat input.	Increase amperage. Select larger electrode and increase amperage.
	Reduce travel speed.

12-18. Troubleshooting - Excessive Penetration



Excessive Penetration

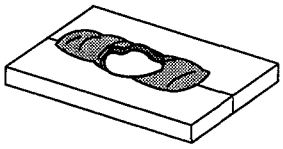


Good Penetration

Excessive Penetration - weld metal melting through base metal and hanging underneath weld.

Possible Causes	Corrective Actions
Excessive heat input.	Select lower amperage. Use smaller electrode.
	Increase and/or maintain steady travel speed.

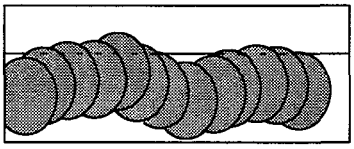
12-19. Troubleshooting - Burn-Through



Burn-Through - weld metal melting completely through base metal resulting in holes where no metal remains.

Possible Causes	Corrective Actions
Excessive heat input.	Select lower amperage. Use smaller electrode.
	Increase and/or maintain steady travel speed.

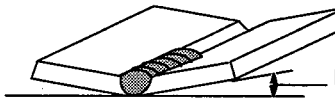
12-20. Troubleshooting - Waviness Of Bead



Waviness Of Bead - weld metal that is not parallel and does not cover joint formed by base metal.

Possible Causes	Corrective Actions
Unsteady hand.	Use two hands. Practice technique.

12-21. Troubleshooting - Distortion



Distortion - contraction of weld metal during welding that forces base metal to move.

Possible Causes	Corrective Actions
Excessive heat input.	Use restraint (clamp) to hold base metal in position.
	Make tack welds along joint before starting welding operation.
	Select lower amperage for electrode.
	Increase travel speed.
	Weld in small segments and allow cooling between welds.

☞ *Hardware is common and not available unless listed.*

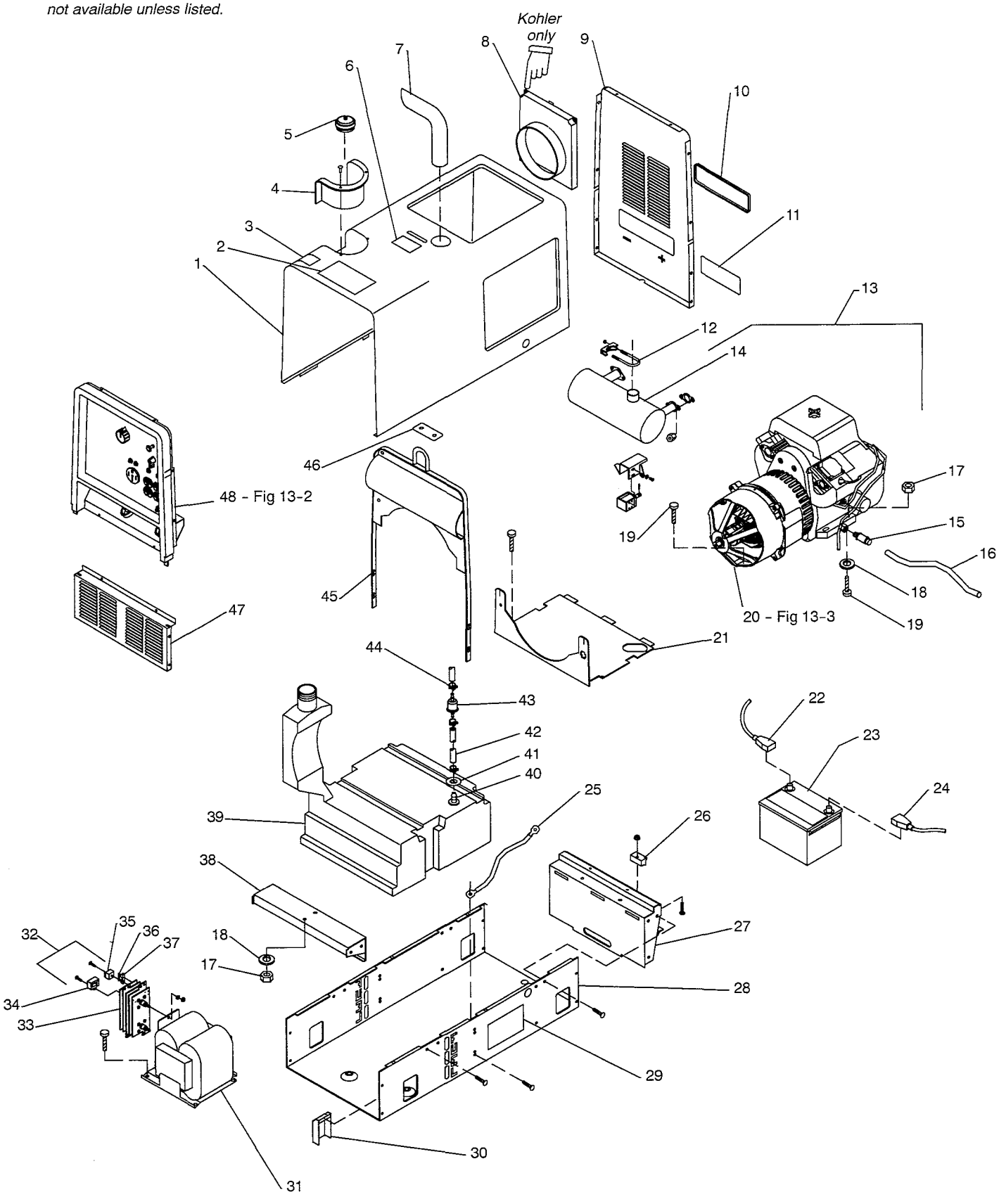


Figure 13-1. Main Assembly (Onan Engine Shown)

Item No.	Dia. Mkgs.	Part No.	Description	Quantity

Figure 13-1. Main Assembly

1		+193 777	Wrapper,	1
2		182 761	Label, Warning Gen. Precautionary Csa	1
3		192 042	Label, Use Gasoline Only	1
4		181 881	Grommet, Plastic Neck Filler Fuel	1
5		147 601	Cap, Tank Screw-on W/Vent	1
6		108 487	Label, Warning:Falling Equipment Can Cause Serious	1
7		183 433	Pipe, Exhaust Elbow	1
8		196 252	Baffle, engine air (Kohler only)	1
9		193 778	Panel, Rear	1
10		194 263	Grommet, Plastic Snap-in Battery Access	1
11		168 385	Label, Warning Battery Explosion Can Blind	1
12		183 314	Clamp, Muffler 1.625 Dia U Pld	1
13		195 845	Engine, Onan Gas Elec Start (consisting of)	1
14		193 845	Muffler, Exhaust Engine (Onan)	1
15		165 271	Valve, Oil Drain 3/8-18 Nptf	1
	F6	*021 718	Fuse, Mintr Gl 30. Amp 32 Volt	1
13		194 249	Engine, Kohler Gas Elec Ch20s-ps-64635	1
14		193 856	Muffler,Exhaust Engine (Kohler) (consisting of)	1
15		165 271	Valve, Oil Drain 3/8-18 Nptf	1
	F6	*021 718	Fuse, Mintr Gl 30. Amp 32 Volt	1
16		196 778	Hose, Vinyl Clear .500 Id X .625 Od X 7.000 (oil drain)	1
17		167 788	Nut, 375-16 .56hex .34h Stl Pld Sem Cone Wshr.88d	3
18		151 542	Washer, Flat .438idx1.000odx.125t Stl Pld	3
19		142 156	Screw, 375-16x1.75 Hexwhd.81d Gr8 Pld	3
20		Figure 13-3	Generator	1
21		193 782	Cover, Tank Fuel	1
22		082 319	Cable, Bat Neg 17.750 No 4 Awg W/Clamp & .343 Rng	1
23		168 037	Battery, Stor 12v 430 Crk 75 Rsv Gp 58 Dry	1
24		173 921	Cable, Bat Pos 28.000 No 4 Awg W/Clamp & .312 Rng	1
25		172 669	Cable, Bat Neg 11.000 6ga W/.250 Rng & .375 Rng	1
26		182 935	Hold Down, Battery	1
27		193 780	Bracket, Mtg Engine	1
28		+193 783	Base,	1
29		194 074	Label, Engine Maintenance Onan/Robin Eh63	1
29		173 088	Label, Engine Maintenance Kohler Ch18/Ch20	1
30		181 057	Cover, Base	2
31	DC-Z	193 922	Stabilizer Assy,	1
32		193 987	Rectifier, W/Components (consisting of)	1
33	SR1	197 514	Rectifier, Si 1ph 280 Amp 400 Piv 60% Duty Cycle	1
34	LEM	191 941	Transducer, Current	1
	PLG6, PLG7	194 065	Cable, Lem	1
35	SR2	035 704	Rectifier, Integ Bridge 40. Amp 800v	1
36	F1	012 655	Fuse, Mintr Cer 10. Amp 250 Volt	1
37		172 731	Holder, Fuse Mintr .250 X 1.250 Clip Anti-pivot	1
38		193 781	Bracket, Mtg Generator	1
39		193 627	Tank, Fuel 10 Gal (consisting of)	1
40		178 632	Ftg, Stand Pipe .250 X 7.375 Lg	1
41		124 253	Bushing, Tank Fuel	1
42		145 976	Hose, Sae .250 Id X .500 Od X 4.500	1
43		066 113	Filter, Fuel Inline .250 (included w/engine)	1
44		084 173	Clamp, Hose .460 - .545 Clp Dia Slfttng	3
45		193 810	Upright, Base	1
46		160 975	Seal, Weather Lift Eye	1
47		180 628	Panel, Front Lower	1
48		Figure 13-2	Panel, front w/components	1

Item No.	Dia. Mkgs.	Part No.	Description	Quantity

Figure 13-1. Main Assembly (Continued)

.....	193 067	.. Kit, Accy 20 Ft (#2) W/Elec Hldr 15 Ft Grd (consisting of)	1
.....	600 319	.... Cable, Weld Cop Strd No 2 Epdm Jkt (order by ft)	35ft
.....	040 234	.... Af-2 Holder, Electrode 200a	1
.....	130 750	.... Clamp, Work 300 Amp	1
.....	600 720	.... Term, Ring Tng 500stud Solistrand 2ga	2
.....	034 377	.... Term, Ring Tng 312stud Solistrand 2ga	1

+When ordering a component originally displaying a precautionary label, the label should also be ordered.
* Recommended Spare Parts.

To maintain the factory original performance of your equipment, use only Manufacturer's Suggested Replacement Parts. Model and serial number required when ordering parts from your local distributor.

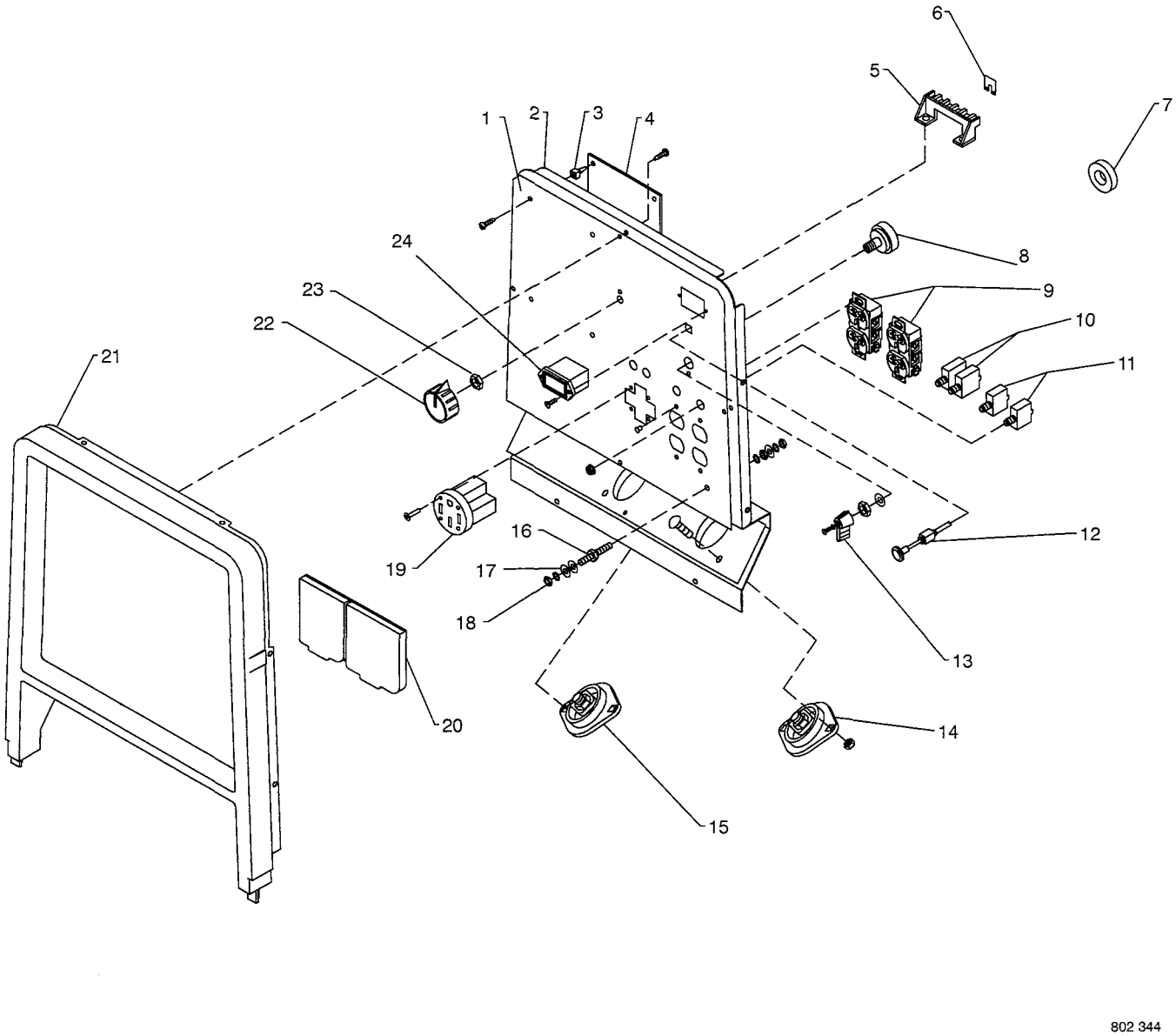


Figure 13-2. Panel, Front w/Components

Item No.	Dia. Mkgs.	Part No.	Description	Quantity

Figure 13-2. Panel, Front w/Components (Figure 13-1 Item 48)

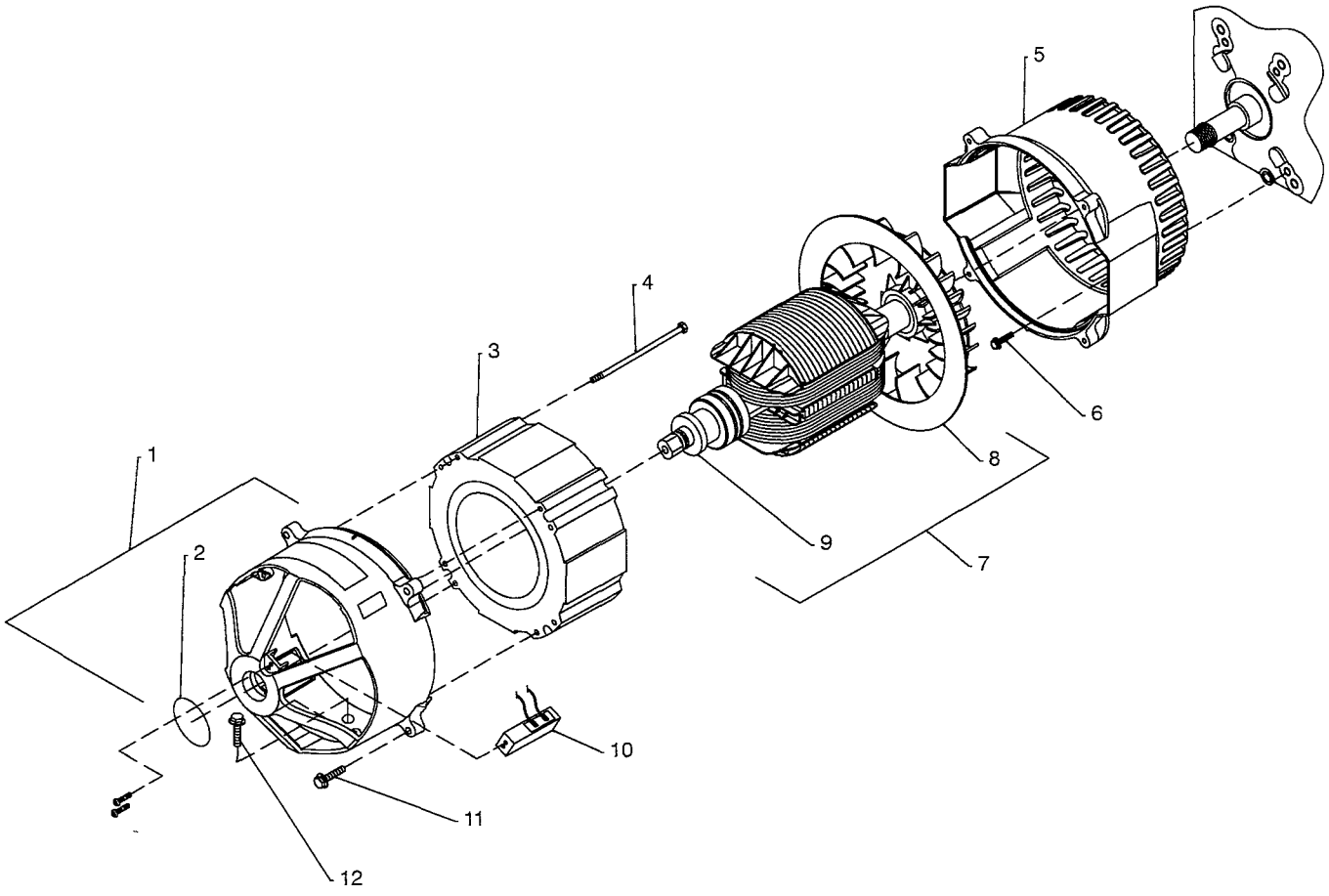
1			Nameplate (order by model & serial no.)	1
2		194 004	Panel, Front	1
3		165 316	Stand-off, No 6-32 X .875 Lg .312 Hex Nyl .156 Ho	4
4	PC1	197 691	Circuit Card Assy, Field Current Controller	1
5	1T	172 661	Block, Stud Connection 6 Position	1
6		173 734	Link, Jumper	2
7	CT1	193 929	Xfmr, Current Sensing	1
8	S2	176 606	Switch, Ignition 4 Position W/Out Handle	1
		193 927	Harness, Wrg Ignition (consisting of)	1
	PLG8	177 859	Conn, Body 5 Terminal	1
	PLG4	116 045	Conn, Rect Univ 084 6p/S 3row Rcpt (Housing, Pins & Skts Service Kit)	1
	PLG5	168 071	Conn, Rect Univ 084 9p/S 3row Rcpt (Housing, Pins & Skts Service Kit)	1
9	RC2, RC3	141 432	Rcpt, Str Dx Grd 2p3w 20a 125v *5-20r	2
10	CB1, CB2	195 955	Circuit Breaker, Man Reset 1p 50a 125vac Screw-90	2
11	CB3, CB4	093 996	Circuit Breaker, Man Reset 1p 20a 250vac Frict	2
12		182 870	Control, Push/Pull Snap-in 35.000 W/1.750 Extension	1
13		119 014	Lever, Switch Black	1
14	POS	039 047	Terminal, Pwr Output Red	1
15	NEG	039 046	Terminal, Pwr Output Black	1
16		083 030	STUD, brs .250-20 x 1.750	1
17		010 915	WASHER, flat brs	3
18		601 836	NUT, .250-20 brs	3
19	RC1	182 954	Rcpt, Str 3p4w 50a 125/250v Flush Mtg *14-50	1
20		188 039	Cover, Receptacle W/Gasket	1
21		159 921	Bezel,	1
22		097 924	Knob, Pointer 1.625 Dia X .250 Id W/Set Screwsplstc	1
23	R1	072 590	Lock, Shaft Pot .375-32 X .250 Dia Shaft Tall	1
24	HM	145 247	Meter, Hour 12-24vdc 1.25 X 2.12 Rect	1

To maintain the factory original performance of your equipment, use only Manufacturer's Suggested Replacement Parts. Model and serial number required when ordering parts from your local distributor.

Item No.	Part No.	Description	Quantity

Figure 13-3. Generator (Figure 13-1 Item 20)

.. 1	+194 621	.. Housing, Generator Front (consisting of)	1
.. 2	183 419	.... O-ring, 1.984 Id X .139 Cs 70 Duro Viton	1
.. 3	193 729	.. Stator, Weld/Pwr Exciter	1
.. 4	195 956	.. Screw, 250-20x5.75 Hexwhd.50d Stl Pld	4
.. 5	185 148	.. Housing, Generator Rear	1
.. 6	186 083	.. Screw, 437-14x1.75 Hexwhd.93d Gr8 Pld	4
.. 7	193 725	.. Rotor, Generator (consisting of)	1
.. 8	181 134	.... Fan, Rotor Gen	1
.. 9	181 143	.... Bearing, Ball Rdl Sgl Row .984 X 2.047 X .59	1
.. 10	180 556	.. Brushholder Assy, Generator	1
.. 11	142 156	.. Screw, 375-16x1.75 Hexwhd.81d Gr8 Pld	4
	013 367	.. Label, Warning Moving Parts Can Cause Serious Etc	1
.. 12	142 156	.. Screw, 375-16x1.75 Hexwhd.81d Gr8 Pld	1



802 345-A

Figure 13-3. Generator

+When ordering a component originally displaying a precautionary label, the label should also be ordered.
To maintain the factory original performance of your equipment, use only Manufacturer's Suggested Replacement Parts. Model and serial number required when ordering parts from your local distributor.

HOBART WELDERS

Champion 10,000 New!

All-in-One 10,000-Watt AC Generator and DC Welder

502-0276
August 1999

PROCESSES

- Stick (SMAW) Welding
- Flux Cored (FCAW) Welding (Gas and Self-Shielded)

5/3/1 WARRANTY

Comes complete with 15 ft Work Cable and Clamp, and 20 ft Welding Lead and Electrode Holder!

Combining a 10,000-watt generator with a 230-amp constant-current DC welder, the Champion 10,000 is ideal for farm, general construction, and emergency power applications. This unit is designed for Stick welding with quick and easy arc starts. It also performs general scratch start DC TIG, and Flux Cored welding. The Champion 10,000 offers a "no-nonsense" warranty. The engine is warranted separately by the engine manufacturer.

FEATURES	BENEFITS
All-in-one 10,000-watt generator and 230-amp welder	You get a generator *and* welder for about what you would pay for just a generator!
Hobart's new *Field Current Control* technology	Smooth arc starts with minimal "sticking". Extraordinary motor starting characteristics. Strong continuous rating to run compressors, pumps, lights, hand tools and other equipment.
Heavy-duty construction	Provides stamina and long dependable service. Enclosed design, large battery, rugged electrical connections and wiring, and circuit-breaker protection.
Lightweight and compact design	Just over 3 ft long and weighs 10 – 20% less than competitive units.
Choice of OHV engines	Modern engines from Onan or Kohler, with 10-gallon fuel tank and low oil pressure shutdown as standard features. Dependable engines conserve fuel and provide long operation before refueling.
A "no tools" oil change and standard hour meter	Help maintain scheduled routine oil servicing (every 100 hours) and other preventative maintenence.
Quick-set current control	Easy to set up and start welding.
Smooth DC weld output	Primarily designed for the Stick process, the Champion 10,000 also provides a smooth arc for general Flux Cored and scratch start DC TIG welding.
Hobart's 5/3/1 Warranty	Five-year warranty on generator and magnetic components. Consult local retailer for details. (The engine is warranted separately by the engine manufacturer.)

SPECIFICATIONS *(SUBJECT TO CHANGE WITHOUT NOTICE.)*

INDUSTRIAL CC DC

Rated Output		Max. Open-Circuit Voltage	Amperage Range	Auxiliary Power	Dimensions	Net Weight
230 amps at 25 V, 30% duty cycle	210 amps at 25 V, 60% duty cycle	73 VDC	50–230 amps	10,000 watts peak; 120/240 VAC, 60Hz, 9,500 watts continuous while not welding	H: 33 in (838 mm) W: 18-3/4 in (476 mm) D: 37-1/2 in (953 mm)	Kohler:428 lb (194 kg) Onan: 439 lb (199 kg)

Rated output decreases approximately 3.5% per 1000 ft (305 m) above sea level. The rated output of any engine-driven welder/generator decreases as temperatures rise. The ratings for the Champion 10,000 were taken at high temperatures, only after the machine reached operating temperature. Even in hot weather the Champion 10,000 has the vigor to let you finish the job.

ENGINE SPECIFICATIONS *(SUBJECT TO CHANGE WITHOUT NOTICE.)*

Engine Brand	Horsepower (HP)	Type	Weld Speed	Idle Speed	Fuel Capacity	Oil Capacity/Change
Kohler #500 434	20 HP at 3600 RPM (2-year mfg. warranty)	Twin-cylinder, 4-cycle, overhead-valve, industrial, air-cooled, gasoline engine	3750 RPM	2200 RPM	10 gallons	1.75 qt (1.7 L) every 100 hours; 2 qt (1.9 L) w/filter every 200 hours
Onan #500 433	20 HP at 3600 RPM (3-year mfg. warranty)	Twin-cylinder, 4-cycle, overhead-valve, industrial, air-cooled, gasoline engine	3750 RPM	2200 RPM	10 gallons	1.6 qt (1.55 L) every 100 hours; 1.8 qt (1.75 L) w/filter every 200 hours

Hobart Welders An Illinois Tool Works Company

U.S. Sales	Phone 920-735-4576	FAX 800-637-2315
Canadian Sales	Phone 888-489-9353	FAX 519-421-0480
International Sales	Phone 920-735-4509	FAX 920-735-4125

Web Site www.HobartWelders.com

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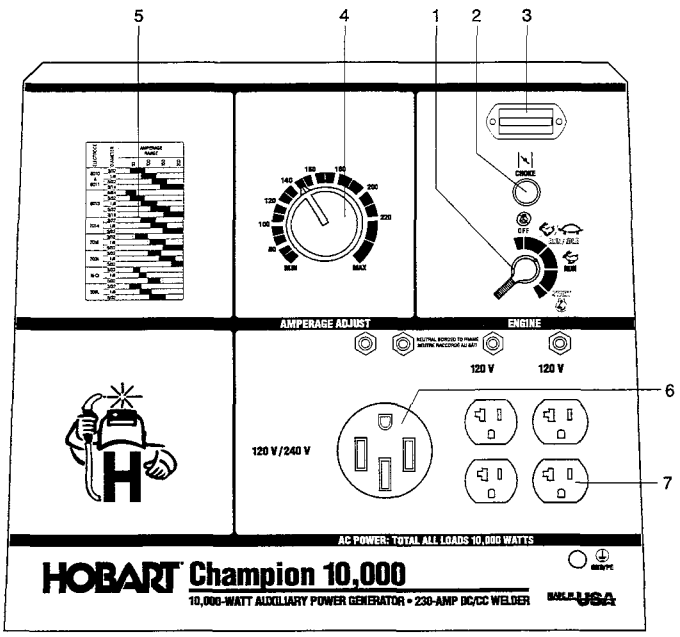
CONTROL PANEL



1. Engine Control Switch allows for engine speed selection. In Run/Idle position, engine runs at idle speed at no load, and weld/power speed under load.
2. Engine Choke Control. Use control to change engine air/fuel mix.
3. Engine Hour Meter. Combined with the Fastex "no tools" oil change feature, routine service is easily monitored and performed.
4. Amperage Control. Easy to set up for welding, and the amperage control does not have to be turned up to maximum to gain full auxiliary output.
5. Amperage Selection Chart. Explains weld settings for typical electrode diameter sizes and types.
6. 120/240 Volt Receptacle. This versatile, 50-amp circuit-breaker-protected receptacle can supply up to 10,000 watts of 230-volt power or, up to 10,000 watts of 120-volt power through two separate120-volt circuits. (Note: Protective covers not shown.)
7. 120 Volt Receptacle. Protected by two 20-amp circuit breakers. Optional GFCI circuit breakers are available (factory installed) and recommended.

PERFORMANCE DATA

Fuel Consumption Data

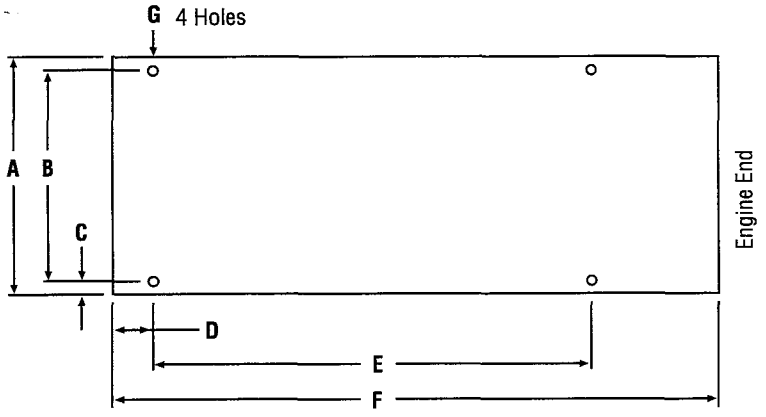
The Champion 10,000 offers modern, fuel efficient engines from Onan or Kohler. With the OHV design, automatic idle and 10 gallon fuel tank, you can expect to put in long hours before having to stop and refuel. For example:

- Welding at 125 amps, 100% duty cycle, uses about 1 gal of fuel every hour.
- While not welding, the engine drops to idle speed using about 1/2 gal of fuel every hour.
- On a typical job using 1/8-in 7018 electrodes (125 amps, 20% duty cycle) you can expect over 16 hours of operation.
- Under a continuous load of 4,000 watts of auxiliary power, the Champion 10,000 would run for about 9 hours.

Typical Power Requirements for Farm, Home and Contractor Equipment

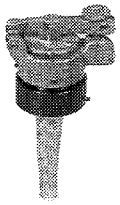
Equipment	Rating	Starting Watts	Running Watts	Equipment	Rating	Starting Watts	Running Watts
Portable Conveyor	1/2 HP	3400	1000	Band Saw	14 in	2500	1100
Farm-Duty Motors Std., (e.g. Conveyors, Feed Augers, Air Compressors)	1/3 HP 1-1/2 HP	1720 8200	720 2200	Air Compressor	1-1/2 HP	8200	2200
				Electric Chain Saw	2 HP, 14 in	1100	1100
Washer 2 gal/min 2 gal/min	550 PSI 700 PSI	4500 6100	1400 1600	Flood Lights	HID Metal Halide Mercury Vapor	125 313 1000 1250	100 250 — 1000
Refrigerator or Freezer	1/3 HP	2150	750				
Sump Pump	1/2 HP	3200	1050	Submersible Pump	400 gph	600	200
Hand Drill	1/2 in	600	600	Centrifugal Pump	900 gph	900	500
Circular Saw	8-1/4 in	1400	1400	High Pressure Washer	1 HP	6100	1600
Table Saw	10 in	6300	1800	Wet & Dry Vac	1.7 HP	900	900

MOUNTING SPECIFICATIONS



A. 18 in (457 mm)
B. 16-9/16 in (421 mm)
C. 3/4 in (19 mm)
D. 3 in (76 mm)
E. 31-1/2 in (800 mm)
F. 37-1/2 in (953 mm)
G. 13/32 in (10 mm) Diameter

OPTIONS



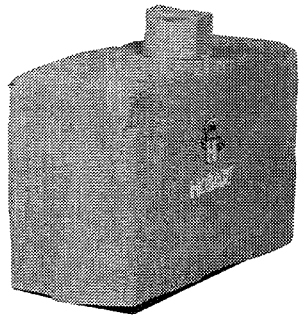
FA-7.5 Flame Arrestor Fuel Cap (Gasoline Red) #042 632 Field
Lockable for added protection.

Spark Arrestor #043 579 Field
Mandatory when operating on California grass-lands, brush, or forest-covered land, and all National Forests. For other areas, check your state and local laws.

Full KVA Plug Kit #119 172 Field
240 VAC, 50-amp plug (NEMA 14-50P) to fit full KVA receptacle.

GFCI Panel Mount Kit #195 968 Factory
Ground Fault Circuit Interruptors are required on many construction sites. Kit contains two GFCI 120 VAC duplex receptacles. (240 VAC GFCI receptacle not required.)

ACCESSORIES

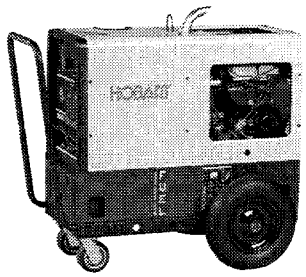


CC-1 Series Canvas Cover #043 980
Attractive, waterproof canvas cover resists stains and mildew, and protect the finish of your welder.

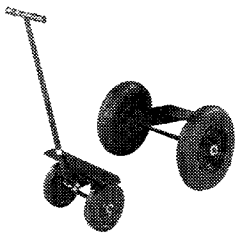
Cable Holder #043 046
The saddle-bag-style cable holder is perfect match to No. 4B or No. 31 running gear. Convenient wrap-around storage of coiled cable for transportation.
Note: For best results do not weld when cable is coiled!

No. 2WA Stick Welding Accessory Package #040 039
Consists of 35 ft (10.7 m) No. 2 electrode cable with insulated electrode holder and lug, 30 ft (9.1 m) No. 2 work cable with work clamp and lug, welding helmet, and wire scratch brush.

Running Gears

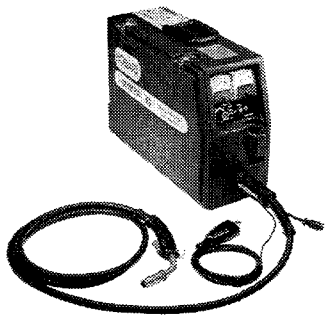


No. 31 Hand Running Gear #195 965
Rugged, lightweight design provides maximum maneuverability. Comes with standard handle, two large 480/400 x 8 pneumatic tires, two 5 in rubber swivel casters, adjustable axle and easy-to-read instructions.

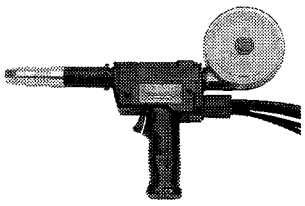


No. 4B Running Gear #041 930
Includes two rear wheels with 480/400 x 8 pneumatic tires, two 8 in (203 mm) solid-rubber-tired front wheels and a 30 in (762 mm) towing handle.

Wire Feeders



Olympic VS Series Wire Feeder
Lit. Index No. 502-0222
Compact, portable wire feeder for .023–5/64 in (0.6–2.0 mm) hard and flux cored wire. Optional gas solenoid and output contactor are recommended.



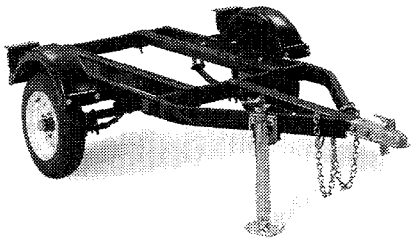
Olympic 30A #130 831-01-9
A 1-lb spoolgun recommended for aluminum fabrication only, when used with the Champion 10,000. Includes 30 ft (9.1 m) cable assembly. HWC-115A required.

HWC-115A Weld Control with Contactor #137 546-02-2
Required when using the Olympic 30A with the Champion 10,000.

Plasma Cutter

Cybercut 1025 Lit. Index No. 502-0214
Economical plasma cutting system rated to cut 3/8 in.

Trailers



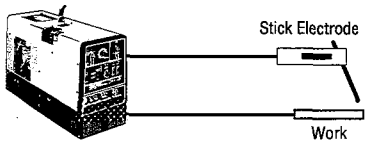
HWY-210 Trailer #043 804
A 1350 lb (612 kg) capacity highway trailer with welded steel tubing frame, heavy-duty axle with roller bearing hubs and leaf-spring suspension. The HWY-210 comes with jack stand, 2 in (50 mm) ball hitch, fenders and lights.

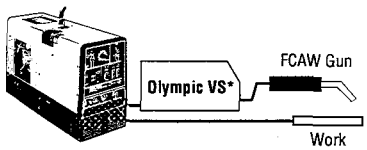
OFR-210 Trailer #043 803
A 1350 lb (612 kg) capacity off-road trailer with welded steel tubing frame, heavy-duty axle with roller bearing hubs and leaf-spring suspension. The OFR-210 comes with jack stand and 2 in (50 mm) ball hitch.

Cable Tree #043 826
Provides an area to conveniently wrap weld cables and extension cords. For use with both 210 trailers.

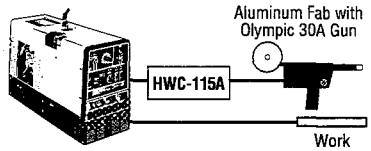
Lunette Eye 2-1/2 in (64 mm) #043 824
For use with both 210 trailers.

Clevis (not for highway use) #043 825
For use with both 210 trailers.





Optional contactor and gas solenoid recommended.



ORDERING INFORMATION AND SYSTEM CHECKLIST

Equipment and Options	Stock No.	Description	Qty.	Price
Champion 10,000	**#500 433** **#500 434**	With Onan engine With Kohler engine		
FA-7.5 Flame Arrestor Fuel Cap	**#042 632**	Field		
Spark Arrestor	**#043 579**	Field		
Full KVA Plug	**#119 172**	Field		
GFCI Panel Mount Kit	**#195 968**	Factory. Includes two GFCI 120 VAC duplex receptacles		
Accessories				
Canvas Cover	**#043 980**			
Cable Holder	**#043 046**			
No. 31 Running Gear	**#195 965**			
No. 4B Running Gear	**#041 930**			
HWY-210 Trailer	**#043 804**			
OFR-210 Trailer	**#043 803**			
Cable Tree	**#043 826**			
Lunette Eye	**#043 824**	2-1/2 in (64 mm)		
Clevis	**#043 825**	Not for highway use		
Stick Accessories				
No. 2WA Stick Welding Accessory Package	**#040 039**	Includes #2, 35 ft electrode cable and holder, 30 ft work cable with clamp and lug, welding helmet and wire scratch brush		
Stick Electrodes				
Flux Cored Accessories				
Olympic VS Wire Feeder	**#159 928-03-11**	Feeder with contactor kit, Tweco/Lenco connector and gas valve. See Lit. Index No. 502-0222		
Drive Rolls				
FCAW Gun				
Gun Consumables				
Aluminum Fab Accessories				
Olympic 30A Spoolgun	**#130 831-01-9**	Requires HWC-115A weld control		
HWC-115A Weld Control	**#137 546-02-2**	Required for use with Olympic 30A		
TIG Accessories				
TIG Torch				
Torch Consumables				
Tungsten				
Filler Metal				
Plasma Cutter				
Cybercut 1025		See Lit. Index No. 502-0214		
Miscellaneous				
Helmet				
Gloves				
Electrode Container				
Quick Disconnects				

Date: **Total Quoted Price:**

HOBART® WELDERS

DISTRIBUTED BY:

Litho in USA

Warranty Questions?

Call
1-877-HOBART1
for your local
Hobart distributor.

Service
You always get the fast, reliable response you need. Most replacement parts can be in your hands in 24 hours.

Support
Need fast answers to the tough welding questions? Contact your distributor or call 1-800-332-3281. The expertise of the distributor and Hobart is there to help you, every step of the way.

HOBART WELDERS

HOBART 5/3/1 WARRANTY

Effective October 1, 1999

5/3/1 WARRANTY applies to all Handler 135 and 175 models, Airforce 250, 250A, and 375 models, and Champion 10,000 models.This warranty also applies to the Beta-Mig 1800, Champ 1435, 2060, 8500 models, Ironman 250, Stickmate models, Tigmate models, and HSW-15 and HSW-25 spot welder models effective with Serial No. KK200262 and newer.

This limited warranty supersedes all previous Hobart warranties and is exclusive with no other guarantees or warranties expressed or implied.
Hobart products are serviced by Hobart or Miller Authorized Service Agencies.

LIMITED WARRANTY - Subject to the terms and conditions below, Hobart/Miller Electric Mfg. Co., Appleton, Wisconsin, warrants to its original retail purchaser that new Hobart equipment sold after the effective date of this limited warranty is free of defects in material and workmanship at the time it is shipped by Hobart. THIS WARRANTY IS EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS.

Within the warranty periods listed below, Hobart/Miller will repair or replace any warranted parts or components that fail due to such defects in material or workmanship. Hobart/Miller must be notified in writing within thirty (30) days of such defect or failure, at which time Hobart/Miller will provide instructions on the warranty claim procedures to be followed.

Hobart/Miller shall honor warranty claims on warranted equipment listed below in the event of such a failure within the warranty time periods. All warranty time periods start on the date that the equipment was delivered to the original retail purchaser, or one year after the equipment is sent to a North American distributor or eighteen months after the equipment is sent to an International distributor.

1. 5 Years — Parts and Labor
   * Original Main Power Rectifiers
   * Transformers
   * Stabilizers
   * Reactors
   * Rotors, Stators and Brushes
2. 3 Years — Parts and Labor
   * Drive Systems
   * PC Boards
   * Idle Module
   * Solenoid Valves
   * Switches and Controls
   * Spot Welder Transformer
3. 1 Year — Parts and Labor (90 days for industrial use)
   * Motor-Driven Guns
   * MIG Guns/TIG Torches
   * Relays
   * Contactors
   * Regulators
   * Water Coolant Systems
   * HF Units
   * Running Gear/Trailers
   * Plasma Cutting Torches
   * Remote Controls
   * Replacement Parts (No labor)
   * Accessories
   * Field Options
     (NOTE: Field options are covered for the remaining warranty period of the product they are installed in, or for a minimum of one year — whichever is greater.)
4. Engines, batteries and tires are warranted separately by the manufacturer.

Hobart's 5/3/1 Limited Warranty shall not apply to:

1. Items furnished by Hobart/Miller, but manufactured by others, such as engines or trade accessories. These items are covered by the manufacturer's warranty, if any.
2. Consumable components such as contact tips, cutting nozzles, slip rings, drive rolls, gas diffusers, plasma torch tips and electrodes, weld cables, and tongs and tips, or parts that fail due to normal wear.
3. Equipment that has been modified by any party other than Hobart/Miller, or equipment that has been improperly installed, improperly operated or misused based upon industry standards, or equipment which has not had reasonable and necessary maintenance, or equipment which has been used for operation outside of the specifications for the equipment.

HOBART PRODUCTS ARE INTENDED FOR PURCHASE AND USE BY COMMERCIAL/INDUSTRIAL USERS AND PERSONS TRAINED AND EXPERIENCED IN THE USE AND MAINTENANCE OF WELDING EQUIPMENT.

In the event of a warranty claim covered by this warranty, the exclusive remedies shall be, at Hobart's/Miller's option: (1) repair; or (2) replacement; or, where authorized in writing by Hobart/Miller in appropriate cases, (3) the reasonable cost of repair or replacement at an authorized Hobart/Miller service station; or (4) payment of or credit for the purchase price (less reasonable depreciation based upon actual use) upon return of the goods at customer's risk and expense. Hobart's/Miller's option of repair or replacement will be F.O.B., Factory at Appleton, Wisconsin, or F.O.B. at a Hobart/Miller authorized service facility as determined by Hobart/Miller. Therefore no compensation or reimbursement for transportation costs of any kind will be allowed.

TO THE EXTENT PERMITTED BY LAW, THE REMEDIES PROVIDED HEREIN ARE THE SOLE AND EXCLUSIVE REMEDIES. IN NO EVENT SHALL HOBART/MILLER BE LIABLE FOR DIRECT, INDIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES (INCLUDING LOSS OF PROFIT), WHETHER BASED ON CONTRACT, TORT OR ANY OTHER LEGAL THEORY.

ANY EXPRESS WARRANTY NOT PROVIDED HEREIN AND ANY IMPLIED WARRANTY, GUARANTY OR REPRESENTATION AS TO PERFORMANCE, AND ANY REMEDY FOR BREACH OF CONTRACT TORT OR ANY OTHER LEGAL THEORY WHICH, BUT FOR THIS PROVISION, MIGHT ARISE BY IMPLICATION, OPERATION OF LAW, CUSTOM OF TRADE OR COURSE OF DEALING, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR PARTICULAR PURPOSE, WITH RESPECT TO ANY AND ALL EQUIPMENT FURNISHED BY HOBART/MILLER IS EXCLUDED AND DISCLAIMED BY Hobart/Miller.

Some states in the U.S.A. do not allow limitations of how long an implied warranty lasts, or the exclusion of incidental, indirect, special or consequential damages, so the above limitation or exclusion may not apply to you. This warranty provides specific legal rights, and other rights may be available, but may vary from state to state.

In Canada, legislation in some provinces provides for certain additional warranties or remedies other than as stated herein, and to the extent that they may not be waived, the limitations and exclusions set out above may not apply. This Limited Warranty provides specific legal rights, and other rights may be available, but may vary from province to province.

Owner's Record

Please complete and retain with your personal records.

Model Name Serial/Style Number

Purchase Date (Date which equipment was delivered to original customer.)

Distributor

Address

City

State Zip

Resources Available

Always provide Model Name and Serial/Style Number.

To locate a Distributor, retail or service location:

Call 1-877-Hobart1 or visit our website at www.HobartWelders.com

For technical assistance:

Call 1-800-332-3281

Contact your Distributor for:

Welding Supplies and Consumables

Options and Accessories

Personal Safety Equipment

Service and Repair

Replacement Parts

Training (Schools, Videos, Books)

Technical Manuals (Servicing Information and Parts)

Circuit Diagrams

Welding Process Handbooks

Contact the Delivering Carrier for:

For assistance in filing or settling claims, contact your distributor and/or equipment manufacturer's Transportation Department.

File a claim for loss or damage during shipment.

Hobart Welding Products
An Illinois Tool Works Company
600 West Main Street
Troy, OH 45373 USA

For Technical Assistance:
Call1-800-332-3281
For Literature Or Nearest Dealer:
Call 1-877-Hobart1

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